

**ANNUAL REPORT**

OF THE

**DEPARTMENT OF THE INTERIOR**

FOR THE

Fiscal Year ended March 31, 1919

PRINTED BY ORDER OF PARLIAMENT



OTTAWA

J. DE LABROQUERIE TACHÉ  
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY

1920



*To His Excellency the Duke of Devonshire, K.G., P.C., G.C.M.G., G.C.V.O., etc., etc.,  
Governor General and Commander in Chief of the Dominion of Canada.*

MAY IT PLEASE YOUR EXCELLENCY:

The undersigned has the honour to lay before Your Excellency the report of the transactions of the Department of the Interior for the fiscal year ending March 31, 1919.

Respectfully submitted,

A. MEIGHEN,  
*Minister of the Interior.*

OTTAWA, August 5, 1919.



## TABLE OF CONTENTS.

	PAGE
Report of Deputy Minister.. . . . .	1

## PART I.—DOMINION LANDS.

Report of the Commissioner.. . . . .	3
“ “ Chief Inspector of Dominion Lands Agencies.. . . . .	3
“ “ Inspector of Dominion Lands Agencies, Moosomin, Sask.. . . . .	4
“ “ Dominion Lands Sub-Agencies, Manitoba and Saskatchewan.. . . . .	5
“ “ Homestead Inspectors in Manitoba and Saskatchewan.. . . . .	6
“ “ Inspector of Dominion Lands Agencies, Calgary .. . . . .	7
“ “ Dominion Lands Sub-Agencies, Alberta and British Columbia.. . . . .	8
“ “ Homestead Inspectors in Alberta and British Columbia.. . . . .	9
“ “ Agent of Dominion Lands, Battleford.. . . . .	10
“ “ “ “ “ Calgary.. . . . .	11
“ “ “ “ “ Dauphin.. . . . .	12
“ “ “ “ “ Edmonton.. . . . .	13
“ “ “ “ “ Grande Prairie.. . . . .	14
“ “ “ “ “ Kamloops.. . . . .	15
“ “ “ “ “ Lethbridge.. . . . .	16
“ “ “ “ “ Moosejaw.. . . . .	17
“ “ “ “ “ New Westminster.. . . . .	18
“ “ “ “ “ Prince Albert.. . . . .	19
“ “ “ “ “ Revelstoke.. . . . .	20
“ “ “ “ “ Saskatoon.. . . . .	21
“ “ “ “ “ Swift Current.. . . . .	22
“ “ “ “ “ Winnipeg.. . . . .	23
“ “ Mining Lands and Yukon Branch.. . . . .	23
“ “ Gold Commissioner.. . . . .	28
“ “ Crown Timber and Land Agent.. . . . .	30
“ “ Inspecting Engineer, Mining Lands and Yukon Branch.. . . . .	31
“ “ Timber and Grazing Lands Branch.. . . . .	33
“ “ Chief Inspector of Crown Timber Agencies.. . . . .	35
“ “ School Lands Division.. . . . .	39
“ “ Lands Patent Branch.. . . . .	45
“ “ Acting Superintending Accountant.. . . . .	54
“ “ Ordnance and Admiralty Lands Branch.. . . . .	56

## PART II.—DOMINION PARKS.

Report of the Commissioner of Dominion Parks.. . . . .	3
“ “ Superintendent of Rocky Mountain Park.. . . . .	10
Nationalities of visitors to Rocky Mountain Park from April 1, 1918, to March 31, 1919.. . . . .	13



PART II.—DOMINION PARKS—*Concluded.*

	PAGE.
Report of the Curator of Banff Museum.. . . .	16
“ “ Secretary of the Alpine Club of Canada.. . . .	17
“ “ Superintendent of Yoho Park.. . . .	20
“ “ “ Glacier Park.. . . .	22
“ “ “ Revelstoke Park.. . . .	22
“ “ “ Jasper Park.. . . .	24
“ “ “ Waterton Lakes Park.. . . .	25
“ “ “ Buffalo Park.. . . .	27
“ “ “ Elk Island Park.. . . .	28
“ “ Hon. “ Fort Anne Park.. . . .	29
“ “ “ St. Lawrence Island Parks.. . . .	30
Agreement with Province of British Columbia <i>re</i> “Parks”.. . . .	30
“ “ “ Alberta “ “ “ .. . . .	34

## PART III.—FORESTRY.

Report of the Director.. . . .	3
--------------------------------	---

## PART IV.—RECLAMATION.

Report of the Director of the Reclamation Service.. . . .	3
Summary Report on Irrigation and Canadian Irrigation Surveys.. . . .	8

## PART V.—WATER POWER.

Report of the Director of Water Power.. . . .	3
Dominion Power Board.. . . .	3
Water Resources Conference.. . . .	3
Water Power Bill.. . . .	4
Water Power Regulations and Legal Research.. . . .	4
Dominion Hydrometric Survey.. . . .	5
Lake of the Woods Control Board.. . . .	5
British Columbia Water Lands Regulations.. . . .	5
Costs of Hydrometric and Water Power Surveys.. . . .	5
Report of the Assistant Director.. . . .	6
Hydrometric Surveys.. . . .	6
British Columbia.. . . .	7
Manitoba.. . . .	7
New Brunswick.. . . .	7
Power and Storage Surveys.. . . .	8
Co-operation with the Province of Ontario and Prince Edward Island.. . . .	9
Co-ordination of Maritime Provinces Investigatory Work.. . . .	10
Dominion Land Surveys and Reclamation.. . . .	10
Lake of the Woods Regulation.. . . .	10
Research into Utilization of Off-peak Power.. . . .	11
Water Resources Inventory.. . . .	11
Census of Developed Water Power.. . . .	14
Co-ordination of Empire Water Resources.. . . .	15



# REPORT

OF THE

## DEPARTMENT OF THE INTERIOR

### 1918-19.

---

Hon. ARTHUR MEIGHEN,  
Minister of the Interior,  
Ottawa.

I have the honour to submit the 46th Annual Report of the Department of the Interior for the twelve months ending the 31st of March, 1919, which shows that very considerable progress has been made with the task of settling returned soldiers upon Dominion lands in the Prairie Provinces.

The lands most suitable for farming and nearest to markets have been reserved for soldiers, but notwithstanding, we have also had a very considerable number of entries made outside of these reserved tracts by other bona fide settlers.

A large number of those who entered a few years ago are now applying for title and making final payments in connection with pre-emptions and purchased homesteads so that the revenue collected by the department has been very satisfactory.

A glance at our latest homestead map will show that the amount of Dominion land within reasonable distance of railway facilities is rapidly diminishing although our officers report that the newly surveyed townships in northern Alberta are remarkably fine agricultural land and will provide homes for all intending settlers for some years to come.

A Reclamation Service has been constituted and reconnaissance surveys are being conducted with a view to reclaiming and making productive large areas of vacant Dominion lands which are at present unsuitable for agriculture. Both irrigation and drainage works of an extensive nature are contemplated.

Very considerable progress has been made with the inventory of our natural resources, particularly water-power. It is expected that large development in the direction of the utilization of water-power and other natural resources for public purposes may be looked for in the industrial revival which must surely follow the period of the war.

I append hereto a brief synopsis of the work of the various branches, followed by more detailed statements submitted by the head of each branch.



10 GEORGE V, A. 1920

STATEMENT of Gross Cash Receipts received from all sources during the fiscal year ended March 31, 1919, compared with the receipts for the previous fiscal year.

Source of Revenue.	Fiscal Years.		Increase.	Decrease.	Net Decrease.
	1918-1919.	1917-1918.			
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Dominion lands.....	3,615,958 52	4,557,438 61	.....	941,480 09	.....
School lands ... ..	5,087,875 81	2,836,216 40	2,251,659 41	.....	.....
Ordinance lands. ....	4,819 27	7,929 75	.....	3,110 48	.....
Seed grain.....	1,378,275 76	2,613,708 67	.....	1,235,432 91	.....
Casual revenue . ....	12,381 71	9,074 15	3,307 56	.....	.....
Registration fees—Yukon...	789 22	562 25	226 97	.....	.....
Fines and forfeitures.....	.....	170 00	.....	170 00	.....
Fines and forfeitures—N.W.T.	35 00	383 00	.....	348 00	.....
Fines under Immigration Act	.....	3,133 00	.....	3,133 00	.....
Chinese immigration revenue	.....	336,757 00	.....	336,757 00	.....
Sales of land—special account	239,075 10	626,203 49	.....	387,128 39	.....
Deduct revenue from Chinese immigration and fines under Immigration Act now collected by Dept. of Immigration and Colonization..	10,339,210 39	10,991,576 32	2,255,193 94	2,907,559 87	652,365 93
	.....	339,890 00	.....	339,890 00	339,890 00
Totals .....	10,339,210 39	10,651,686 32	2,255,193 94	2,567,669 87	312,475 93



## SESSIONAL PAPER No. 25

STATEMENT of Cash Receipts on account of Dominion Lands Revenue for the fiscal year ended March 31, 1919, as compared with the receipts for the previous fiscal year.

Particulars.	1918-19.	1917-18.	Increase.	Decrease.	Net Decrease.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Homestead fees .....	42,190 00	83,180 00	.....	40,990 00	.....
Pre-emption fees.....	.....	7,870 00	.....	7,870 00	.....
Purchased homestead fees.....	.....	2,040 00	.....	2,040 00	.....
Improvements.....	48,655 97	88,198 99	.....	39,533 02	.....
Pre-emption sales under Act, 1908.....	1,899,359 52	2,596,932 35	.....	697,572 83	.....
Purchased homestead sales.....	150,063 46	245,834 54	.....	95,771 08	.....
General sales.....	131,881 45	191,729 12	.....	59,847 67	.....
Sale fees.....	170 00	.....	170 00	.....	.....
Map sales, office fees, etc.....	11,039 54	12,066 22	.....	1,026 68	.....
Rental of land.....	19,302 85	10,603 38	8,699 47	.....	.....
Survey fees.....	48,287 00	7,915 99	40,371 01	.....	.....
Timber dues.....	408,728 28	482,006 25	.....	73,277 97	.....
Grazing rental.....	148,179 55	125,300 69	22,878 86	.....	.....
Grazing lands, improvements.....	560 00	1,172 60	.....	612 60	.....
Coal lands .....	375,895 14	334,889 57	41,005 57	.....	.....
Hay permits.....	22,085 06	10,861 62	11,223 44	.....	.....
Mining fees.....	52,342 25	59,679 31	.....	7,337 06	.....
Hydraulic leases.....	4,393 72	2,273 23	2,120 49	.....	.....
Dredging leases.....	1,745 10	2,943 45	.....	1,198 35	.....
Export tax on gold .....	48,677 07	81,650 55	.....	32,973 48	.....
Free certificates for export of gold .....	10 50	35 00	.....	24 50	.....
Stone quarries .....	8,221 59	7,117 30	1,104 29	.....	.....
Rent of water-power.....	1,452 32	1,210 00	242 32	.....	.....
Sand, stone and gravel .....	1,104 44	1,984 98	9 46	.....	.....
Petroleum.....	107,230 41	124,179 69	.....	16,949 28	.....
Potash leases.....	3,906 10	60 00	3,846 10	.....	.....
Irrigation fees.....	483 87	458 75	25 12	.....	.....
Irrigation sales.....	11,556 38	11,595 54	.....	39 16	.....
Fees re Board of Examiners, D.L.S.....	100 00	250 00	.....	150 00	.....
Patent and interchange fees.....	190 00	160 00	30 00	.....	.....
Suspense account.....	6,837 93	3,598 95	3,238 98	.....	.....
Interim receipt account, Yukon.....	15 00	153 00	.....	138 00	.....
Forestry branch—sale of trees, etc.....	2,604 17	3,907 50	.....	1,303 33	.....
Fishing permits.....	824 00	67 00	757 00	.....	.....
Miscellaneous.....	2,849 13	4,242 52	.....	1,393 39	.....
Rocky Mountain park .....	46,978 49	43,632 08	3,346 41	.....	.....
Jasper park .....	4,285 91	5,292 83	.....	1,006 92	.....
Waterton lakes park .....	1,992 95	1,307 65	685 30	.....	.....
Yoho park .....	1,074 38	502 40	571 98	.....	.....
Buffalo park.....	145 95	142 46	3 49	.....	.....
Elk island park .....	10 25	1 00	9 25	.....	.....
Glacier park .....	43 22	331 90	.....	288 68	.....
Moose Mt. Buffalo reserve.....	102 40	.....	102 40	.....	.....
Antelope park.....	195 20	905 20	.....	710 00	.....
Fort Anne park.....	116 37	45 00	71 37	.....	.....
Point Pelee park .....	31 60	.....	31 60	.....	.....
Revelstoke park .....	20 00	.....	20 00	.....	.....
Bird sanctuaries, Lac la Biche.....	10 00	.....	10 00	.....	.....
Refunds.....	3,615,958 52	4,557,438 61	140,573 91	1,082,054 00	941,480 09
	76,031 02	113,680 44	.....	37,649 42	.....
	3,539,927 50	4,443,758 17	140,573 91	1,044,404 58	903,830 67

In addition to \$131,881.45 on account of general sales, the department received \$239,075.10 from sales of railway lands, which sum, as provided for by Orders in Council, has been credited to special accounts in the books of the Finance Department.



STATEMENT showing Receipts on account of Dominion Lands from July 1, 1872, to March 31, 1919.

Fiscal Year.	Homestead Fees.	Pre-emption Fees.	Improvements.	SALES.		Map Sales, Office and Registration Fees, etc.	Dominion Lands Surveyors' Examination Fees.	Rents, Survey Fees, Miscellaneous, including Trust Account.	Purchased, Homestead, Inspection, Cancellation and Sundry Fees.	Timber Dues.
				Cash.	Scrp.					
1872-73.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
1873-74.	6,960 00			19,170 20						109 25
1874-75.	7,310 00			19,834 75				125 50		2,710 55
1875-76.	11,510 00			13,666 90		129 00				2,335 25
1876-77.	4,680 00			3,478 94						387 00
1877-78.	2,250 00			1,085 86	320 00				40 00	320 00
1878-79.	14,540 00			2,794 86	136,955 16		180 00		290 00	1,620 00
1879-80.	17,690 00			4,998 39	120,159 54		310 00	13 70	410 00	325 00
1880-81.	41,255 00	10,241 43		45,708 97	210,904 84		580 00	183 25	1,780 00	25,121 46
1881-82.	20,450 00	10,801 75	269 00	71,170 17	81,685 86		420 00	37 58		32,028 34
1882-83.	54,155 00	39,843 90	1,758 00	1,240,328 27	70,828 30		890 00	58 10		58,753 14
1883-84.	73,015 00	54,725 00	7,114 91	516,092 21	50,590 84		890 00	501 77	0 45	90,066 46
1884-85.	41,580 00	28,810 00	2,596 11	424,863 36	33,638 40		530 00	45,766 53	1,713 00	147,983 10
1885-86.	25,645 00	17,100 00	2,328 75	199,275 32	40,919 67		370 00	50,068 57	2,685 00	87,474 99
1886-87.	26,110 00	14,371 00	1,101 50	76,140 41	45,875 60		360 00	20,070 00	5,025 40	64,820 31
1887-88.	19,614 00	6,887 93	1,971 55	48,175 76	214,657 97		240 00	44,561 00	7,778 53	65,111 74
1888-89.	23,691 00	4,830 00	1,918 35	52,238 36	337,640 19		240 00	20,591 41	12,078 50	94,964 55
1889-90.	39,460 00	10,550 00	4,128 48	57,513 16	313,522 67		220 00	10,389 57	20,402 50	90,290 00
1890-91.	35,920 00	8,580 00	3,250 54	54,896 85	318,238 47		190 00	3,316 23	20,232 50	84,642 95
1891-92.	29,164 10		6,302 61	91,664 98	228,744 47		88 00	7,951 05	14,712 50	102,902 71
1892-93.	46,994 00		6,472 31	108,901 01	171,425 14		135 00	29,898 49	23,104 00	106,461 35
1893-94.	37,689 74		7,113 50	93,671 67	97,822 41		82 00	18,509 35	22,014 00	105,865 24
1894-95.	36,462 26		3,497 76	53,254 71	77,231 18		40 00	13,457 09	11,097 90	81,290 51
1895-96.	29,664 88		3,567 90	37,293 71	27,840 96			6,271 77	6,566 50	74,079 20
1896-97.	18,278 00		3,163 15	46,373 98	23,269 62		50 00	21,679 31	6,810 50	61,923 47
1897-98.	21,179 00		3,737 01	49,335 53	46,929 65		70 00	19,421 98	8,527 00	68,992 82
1898-99.	34,780 00		5,649 63	80,178 64	16,929 38		10 00	21,242 66	10,042 50	119,313 78
1899-1900.	58,235 00		4,297 62	116,698 35	28,918 14		20 00	75,085 95	13,549 00	155,360 63
1900-1901.	72,690 00		4,835 81	103,247 58	21,307 58		190 00	38,072 54	14,937 00	126,345 82
1901-1902.	79,910 00		5,213 22	40,360 93	88,756 22		165 00	70,970 54	12,722 00	209,399 32
1902-1903.	144,425 00		8,481 46	66,950 21	326,270 03		370 00	71,997 30	663 00	207,790 90
1903-1904.	320,409 65		11,829 08	155,507 59	169,767 13		365 00	125,158 56	595 00	470,916 93
1904-1905.	255,772 36		15,119 47	196,750 15	158,452 66		463 50	81,550 46	1,081 00	397,344 33
1905-1906.	304,806 25		21,571 25	154,128 04	188,424 22		906 50	144,924 31	1,205 00	266,951 46
1906-1907 (nine months).	417,834 25		31,795 19	442,588 69	19,644 59		474 00	141,948 55	976 25	292,684 53
1907-1908.	215,449 55		39,763 63	494,117 12	7,654 57		420 00	69,536 31	1,089 51	379,476 32
1908-1909.	301,693 73		71,139 47	656,303 03	11,349 89		690 00	148,914 00	1,283 50	473,608 94
	389,039 00	141,550 15	70,928 86	951,442 25	92,311 24		1,040 00	75,596 96	9,946 50	269,837 52
					20,136 27					



## SESSIONAL PAPER No. 25

1909-1910.....	415,232 00	174,250 00	105,009 07	1,239,037 33	9,973 84	9,135 49	1,577 10	100,257 89	14,028 30	378,010 70
1910-1911.....	445,135 00	156,485 00	143,227 13	1,193,756 04	1,437 84	8,730 01	1,310 00	42,111 92	20,142 85	387,054 96
1911-1912.....	391,703 12	102,070 00	184,825 92	1,967,182 85	3,256 99	11,239 14	1,400 00	44,167 03	14,745 50	400,668 61
1912-1913.....	337,055 00	85,940 00	168,904 42	1,650,491 87	6,157 27	14,483 91	1,040 00	17,866 65	11,380 00	463,738 75
1913-1914.....	317,412 00	61,660 00	187,052 46	1,279,223 51	240 00	16,056 07	1,350 00	40,148 65	8,402 00	378,365 33
1914-1915.....	238,295 00	28,720 00	114,982 17	691,122 56	80 00	14,290 23	970 60	33,234 14	4,776 10	310,934 29
1915-1916.....	170,350 00	22,760 00	112,782 70	1,073,970 21	.....	11,485 83	470 00	19,495 98	3,475 00	378,960 68
1916-1917.....	112,110 20	14,690 00	112,711 33	2,707,203 99	332 61	13,976 95	560 00	21,212 91	2,910 00	429,403 09
1917-1918.....	83,180 00	7,870 00	89,371 59	3,046,091 55	131 47	12,063 22	250 00	26,513 84	2,200 00	482,006 25
1918-1919.....	42,190 00	.....	49,225 97	2,192,860 81	323 41	11,039 54	100 00	77,291 91	360 00	408,728 28
Total.....	5,832,974 09	1,002,736 16	1,619,008 88	23,831,041 66	3,821,056 39	205,769 30	20,026 70	1,800,271 31	315,778 29	8,837,480 81



STATEMENT showing Receipts on account of Dominion Lands from July 1, 1872, to March 31, 1919.

DEPARTMENT OF THE INTERIOR

10 GEORGE V. A. 1920

Fiscal Year.	Grazing Lands.		Hay, Coal, Mining, Stone Quarries, Export Tax on Gold, etc.		Canadian National Park.	Colonization Lands.		Gross Revenue.	Refunds.	Net Revenue.
	Scrip, etc.		Scrip.			Scrip.				
	Cash.		Cash.			Cash.				
	\$	cts.	\$	cts.	\$	cts.	\$	cts.	\$	cts.
1872-73.										26,239 45
1873-74.										29,980 80
1874-75.										27,641 15
1875-76.										8,865 94
1876-77.										140,755 02
1877-78.										139,584 40
1878-79.										234,732 93
1879-80.										206,801 37
1880-81.										206,990 54
1881-82.	2,245 00		40 00							1,805,734 87
1882-83.	22,844 43		913 91							1,051,403 60
1883-84.	11,370 60		640 90							1,001,776 67
1884-85.	17,089 75		815 63							451,564 65
1885-86.	29,562 51	3,131 08	1,284 83							457,973 95
1886-87.	14,242 77	39,487 67	1,570 49	80 00						588,532 80
1887-88.	5,922 47	23,023 28	2,273 73	80 00						569,986 68
1888-89.	2,207 69	16,802 63	3,946 55							594,088 04
1889-90.	1,305 57	9,021 63	9,242 08							462,536 26
1890-91.	3,079 55	16,193 77	8,628 44	160 00						460,990 76
1891-92.	3,726 80	17,222 60	5,616 85							452,151 08
1892-93.	6,380 80	11,542 39	6,266 13							392,324 43
1893-94.	5,740 79	7,687 86	6,243 15							250,069 12
1894-95.	5,353 72	8,628 00	5,229 54							202,983 10
1895-96.	7,071 86	6,255 90	5,813 51							227,694 93
1896-97.	4,715 01	2,500 00	8,518 18							206,853 57
1897-98.	4,728 58	510 39	699,334 76							1,009,741 63
1898-99.	5,245 88		1,130,371 60							1,584,328 32
1899-1900.	8,382 86	4,083 30	1,038,195 42	20 00						1,503,743 00
1900-1901.	4,726 28	14,671 99	1,101,808 33	20 00						1,874,159 09
1901-1902.	7,292 46	8,409 27	737,878 43							1,432,679 25
1902-1903.	13,913 33	15,041 33	687,722 05							1,890,886 83
1903-1904.	19,790 27	15,202 15	495,579 18							1,681,824 70
1904-1905.	36,145 32	5,237 36	364,923 59							1,339,382 35
1905-1906.	51,583 89	80 00	296,769 19							1,709,315 28
1906-1907 (nine months).	43,711 91	400 00	213,852 59							1,490,503 31
1907-1908.	43,211 78	4,048 01	266,415 31							2,094,579 17
1908-1909.	53,312 79	3,257 84	252,972 17							2,277,678 09
1909-1910.	67,434 29	5,081 47	460,154 29							3,022,446 13
1910-1911.	60,702 80	2,356 00	774,569 27							3,306,073 41



SESSIONAL PAPER No. 25

1911-1912	69,519 41	1,520 00	729,240 42	56,497 74	.....	.....	3,978,036 73	197,631 35	3,780,405 38
1912-1913	79,412 76	.....	779,695 53	37,448 72	.....	.....	3,655,202 20	246,105 26	3,409,036 94
1913-1914	84,925 15	320 00	889,863 15	48,800 83	.....	.....	3,313,819 65	277,309 83	3,036,510 32
1914-1915	101,710 58	400 00	1,600,455 09	37,805 97	.....	.....	3,177,806 73	317,764 75	2,860,101 98
1915-1916	118,995 02	160 00	493,280 97	37,493 53	.....	.....	2,413,639 92	143,942 57	2,269,697 35
1916-1917	128,341 50	.....	600,934 13	45,851 45	.....	.....	4,190,238 16	134,243 14	4,055,995 02
1917-1918	125,300 69	240 00	630,427 95	52,160 52	.....	.....	4,557,810 08	113,680 44	4,444,129 64
1918-1919	148,179 55	.....	630,975 74	55,006 72	.....	.....	3,616,281 93	76,031 02	3,540,250 91
Total	1,419,387 42	242,515 92	14,862,462 99	648,113 25	1,947 32	857,461 08	65,348,492 07	2,528,644 37	62,819,847 70

• Including the scrip.



STATEMENT showing yearly the Gross Revenue (in cash only) received from all sources from July 1, 1899, to March 31, 1919.

Fiscal Year.	Dominion Lands.	School Lands.	Seed (Grain.	Ordnance Lands.	Fines and Forfeitures.	Registration Fees.	Casual Revenue.	Chinese Immigration Revenue.	Total.
	\$	\$	\$	\$	\$	\$	\$	\$	\$
	cts.	cts.	cts.	cts.	cts.	cts.	cts.	cts.	cts.
1899-1900	1,410,883 48	220,874 78	15,271 84	11,043 53	1,452 92	21,751 90	3,664 00		1,684,942 45
1900-1901	1,533,197 07	48,049 83	15,711 63	14,604 47	1,977 96	33,979 77	1,587 57		1,649,108 30
1901-1902	1,254,333 56	193,410 75	20,293 06	16,967 36	1,955 61	50,854 99	3,900 62		1,541,715 95
1902-1903	1,716,597 20	392,206 93	28,789 97	17,612 79	5,220 88	81,404 18	2,230 26		2,244,062 21
1903-1904	1,478,106 33	233,769 62	26,122 30	30,494 34	5,911 92	109,233 73	3,402 94		1,887,041 18
1904-1905	1,314,485 40	332,914 48	16,471 34	10,346 90	10,018 49	123,082 86	4,258 14		1,811,577 61
1905-1906	1,701,580 71	608,960 79	12,577 29	10,893 17	3,304 77	180,310 73	8,496 09		2,526,123 55
1906-1907 (9 months).	1,478,749 51	724,353 73	10,850 06	6,663 90	21 00	46,124 20	11,785 81		2,278,548 21
1907-1908	1,908,219 92	708,045 83	12,899 84	8,674 95	1,650 00	2,256 65	20,069 03		2,751,816 22
1908-1909	2,254,283 98	687,422 74	53,590 86	205,749 96	281 00	1,352 13	26,224 29		3,228,904 96
	16,140,437 16	4,150,009 48	212,578 19	333,051 37	31,794 55	650,351 14	85,618 75		21,603,840 64
1909-1910	3,007,390 82	1,292,259 95	175,152 72	189,902 48	211 00	1,471 49	42,625 96		4,709,014 42
1910-1911	3,302,279 57	1,614,733 93	153,351 14	6,009 34	4,052 22	1,378 19	11,336 06		5,093,140 45
1911-1912	3,973,259 74	1,594,533 96	119,634 13	11,566 46	10,510 48	1,066 05	32,824 65	971,339 00	6,714,734 17
1912-1913	3,647,457 61	1,621,508 11	171,342 87	60,607 80	7,150 35	1,241 25	22,873 55	3,549,242 00	9,081,423 54
1913-1914	3,313,259 65	1,215,822 37	176,736 89	5,805 98	7,888 50	966 50	27,884 47	2,644,593 00	7,392,957 36
1914-1915	3,177,386 73	943,717 00	68,263 56	4,416 64	5,828 00	969 85	11,738 10	588,124 00	4,800,443 88
1915-1916	2,443,479 92	934,965 37	2,525,528 50	5,997 98	3,675 21	908 15	28,002 62	19,389 00	5,961,846 75
1916-1917	4,189,905 55	1,699,370 06	3,652,729 95	5,553 26	2,184 72	796 85	15,618 26	140,487 00	9,706,644 75
1917-1918	4,557,438 61	2,836,216 40	2,613,708 67	7,929 75	3,686 00	562 25	9,074 15	336,757 00	10,365,372 83
1918-1919	3,615,958 52	5,087,875 81	1,378,275 76	4,819 27	35 00	789 22	12,381 71		10,100,135 29
	35,227,816 72	18,841,002 96	11,034,723 29	302,608 96	44,621 48	10,149 80	214,359 53	8,249,931 00	73,925,213 74
Increase	19,087,379 56	14,690,993 48	10,822,145 10		12,826 93		128,740 78	8,249,921 00	52,321,373 10
Decrease				30,432 41		640,201 34			



SESSIONAL PAPER No. 25

STATEMENT of Revenue collected within the Canadian National Parks for the fiscal year ended March 31, 1919, as compared with the previous years.

Particulars.	Fiscal Years.		Increase.	Decrease.	Net Increase.
	1918-19.	1917-18.			
<i>Rocky Mountain Park.</i>	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Rent.....	9,994 16	7,561 94	2,432 22		
Timber dues.....	979 37	1,541 46		562 09	
Water rates (sulphur).....	898 59	779 86	118 73		
Cold water rates.....	7,347 71	7,026 78	320 93		
Sewer rates.....	2,990 35	2,552 80	437 56		
Transfer fees.....	120 00	106 00	14 00		
Cave and basin bathing tickets.....	7,711 00	8,278 60		567 60	
Livery licenses.....	221 00	448 00		227 00	
Pool, billiard and bowling licenses.....	190 00	210 00		20 00	
Boat licenses.....	94 00	28 00	66 00		
Butcher licenses.....	80 00	60 00	20 00		
Grazing rental.....	350 00	397 00		47 00	
Hot springs bathing tickets.....	6,096 70	6,612 50		515 80	
Telephone rent.....	2,640 82	2,018 86	591 96		
Fines.....	303 75	177 00	126 75		
Peddlers' licenses.....	68 00	62 00	6 00		
Guides' licenses.....	15 00	50 00		35 00	
Camping permits.....	78 00	61 00	17 00		
Cemetery lots.....	143 00	58 00	85 00		
Tea room licenses.....	220 00	220 00			
Sand.....	15 75	27 42		11 67	
Impounding fees.....		2 00		2 00	
Dog licenses.....	256 00	262 00		6 00	
Automobile licenses.....	3,203 00	2,489 00	714 00		
Scales.....	3 00	40 50		37 50	
Ice.....	11 00	6 00	5 00		
Sale of lime.....	15 25	15 35		10	
Theatre licenses.....	22 00	45 00		23 00	
Building permits.....	17 00	25 00		8 00	
Garden and dairy licenses.....	45 00	100 00		55 00	
Gum machines.....	28 00	42 00		14 00	
Electricians' licenses.....		1 00		1 00	
Boxing licenses.....		10 00		10 00	
Stone quarries.....		119 45		119 45	
Golf coupons.....	2,064 00	2,069 00		5 00	
Sale of lots.....	107 90		107 90		
Coal leases.....	366 85		366 85		
Miscellaneous.....	282 28	98 56	183 72		
	46,978 49	43,632 08	5,613 62	2,267 21	3,346 41
<i>Glacier Park.</i>					
Rent.....	27 72	329 15		301 43	
Camping permits.....	3 00		3 00		
Grazing rental.....	10 00		10 00		
Timber dues.....	2 50	1 75	75		
Building permits.....		1 00		1 00	
	43 22	331 90	13 75	302 43	Decrease. 288 68
<i>Revelstoke Park.</i>					
Rent.....	20 00		20 00		20 00
<i>Jasper Park.</i>					
Rent.....	606 68	3,895 80		3,289 12	
Timber dues.....	84 09	80 78	3 31		
Building permits.....	3 00	13 00		10 00	
Boat licenses and ferry fees.....	5 00	5 00			
Hay dues.....	2 50		2 50		
Peddlers' licenses.....	16 00	12 00	4 00		
Fines.....	181 00	67 00	114 00		
Grazing rental.....	124 00	261 00		137 00	



10 GEORGE V. A. 1920

STATEMENT of Revenue collected within the Canadian National Parks for the fiscal year ended March 31, 1919, as compared with the previous years—*Con.*

Particulars.	Fiscal Years.		Increase.	Decrease.	Net Increase.
	1918-19.	1917-18.			
<i>Jasper Park.—Con.</i>	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Guides' licenses	12 50	27 50		15 00	
Drivers' and livery licenses..	49 00	144 00		95 00	
Camping permits	14 00	85 50		71 50	
Pool, billiard and bowling licenses.....	90 00	210 00		120 00	
Dog licenses	160 00	176 00		16 00	
Restaurant licenses.....	40 00	30 00	10 00		
Theatre licenses.....	12 00	10 00	2 00		
Butcher licenses	10 00	20 00		10 00	
Telephone rent.....	20 00	25 00		5 00	
Cold water rates.....	30 00	223 00		193 00	
Coal leases.....	2,788 38		2,788 38		
Miscellaneous	37 76	7 25	30 51		
	4,285 91	5,292 83	2,954 70	3,961 62	Decrease. 1,006 92
<i>Yoho Park.</i>					
Timber dues.....	72 12	27 00	45 12		
Rent.....	954 66	426 95	527 71		
Transfer fees.....	6 00	4 00	2 00		
Camping permits.....	2 00		2 00		
Cemetery lots.....	3 00	9 00		6 00	
Grazing rental.....	36 60	33 25	3 35		
Miscellaneous.....		2 20		2 20	
	1,074 38	502 40	580 18	8 20	571 98
<i>Waterton Lakes Park.</i>					
Rent.....	215 00	257 48		42 48	
Camping permits.....	128 00	112 00	16 00		
Timber dues.....	31 75	16 25	15 50		
Fines.....	30 00	13 00	17 00		
Guides' licenses	2 50	2 50			
Grazing rental.....	1,462 20	777 92	684 28		
Hay dues.	9 00	2 50	6 50		
Drivers' and livery licenses.....	8 00	22 00		14 00	
Boat licenses.....	49 50	22 00	27 50		
Transfer fees.....	2 00		2 00		
Building permits.....	35 00	42 00		7 00	
Tea room licenses	20 00	20 00			
Miscellaneous.....		20 00		20 00	
	1,992 95	1,307 65	768 78	83 48	685 30
<i>Elk Island Park.</i>					
Timber dues.....	25		25		
Camping permits.....	10 00	1 00	9 00		
	10 25	1 00	9 25		9 25
<i>Buffalo Park.</i>					
Timber dues.....	7 25	7 50		25	
Hay dues.....	126 70	80 10	46 60		
Grazing rental.....	12 00		12 00		
Miscellaneous...		54 86		54 86	
	145 95	142 46	58 60	55 11	3 49
<i>Moose Mt.* Buffalo Park.</i>					
Grazing rental ..	102 40		102 40		102 40



## SESSIONAL PAPER No. 25

STATEMENT of Revenue collected within the Canadian National Parks for the fiscal year ended March 31, 1919, as compared with the previous years.—*Con.*

Particulars.	Fiscal Year.		Increase.	Decrease.	Net Increase.
	1918-19.	1917-19.			
<i>Antelope Park</i>	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Grazing rental .....	195 20	905 20	...	710 00	Decrease. 710 00
<i>Fort Anne Park.</i>					
Hay dues .....	30 00	45 00	...	15 00	
Miscellaneous .....	86 37	...	86 37		
	116 37	45 00	86 37	15 00	71 37
<i>Point Pelee Park.</i>					
Rent. ....	31 60	...	31 60	...	31 60
<i>Bird Sanctuaries—Lac la Biche.</i>					
Rent.....	10 00	...	10 00	...	10 00
Totals .....	55,006 72	52,160 52	10,249 25	7,403 05	2,846 20



THE LAND SITUATION, Manitoba, Saskatchewan and Alberta, corrected to January 1, 1919.

Province.	Surveyed Area.			Unsurveyed Area.			Total Area.		
	Land.	Water.	Total.	Land.	Water.	Total.	Land.	Water.	Total.
Manitoba .....	31,208,717	4,246,300	35,455,017	112,361,981	13,355,300	125,717,281	143,570,698	17,601,600	161,172,298
Saskatchewan.....	76,934,303	1,902,300	78,836,603	75,406,017	6,845,380	82,251,397	152,340,320	8,747,680	161,088,000
Alberta. ....	82,862,766	2,285,050	85,147,816	76,015,894	2,218,690	78,234,584	158,878,660	4,503,740	163,382,400
Totals. ....	191,005,786	8,433,650	199,439,436	263,783,892	22,419,370	286,203,262	454,789,678	30,853,020	485,642,698

A large proportion of the unsurveyed area has not yet been explored, except in a very partial way, and the area suitable for agriculture cannot be estimated with any degree of accuracy.



## SESSIONAL PAPER No. 25

DETAILED STATEMENT of Surveyed Areas in Manitoba, Saskatchewan and Alberta,  
January 1, 1919.

	Manitoba.	Saskatche- wan.	Alberta.	Total.
	Acres.	Acres.	Acres.	Acres.
Area under homestead (including military home- steads) . . . . .	8,417,400	27,133,700	18,145,500	53,696,600
Area under pre-emption and pur. p'ds (Sept. 1, 1908, to Mar. 20, 1918) . . . . .		5,854,200	2,825,300	8,679,500
Area under Half-Breed scrip, sales, special grants, etc. . . . .	5,087,400	2,302,000	1,223,300	8,612,700
Area granted to railway companies . . . . .	3,566,997	15,177,063	13,120,014	31,864,074
Area granted to Hudson's Bay Company . . . . .	1,210,000	3,087,000	2,092,000	6,389,000
Area of school land endowment ( $\frac{2}{3}$ of area surveyed in sections . . . . .	1,624,600	3,932,000	3,722,800	9,279,400
Area sold under irrigation system . . . . .		76,672	980,850	1,057,522
*Area under timber licenses . . . . .	1,079,300	1,119,200	1,353,100	3,551,600
*Area under grazing leases . . . . .	82,700	3,009,100	2,902,400	5,994,200
*Area of forest reserves and parks . . . . .	2,606,400	6,195,700	16,754,700	25,556,800
*Area reserved for forestry purposes (inside surveyed tract) . . . . .	746,300	1,430,000	1,677,500	3,853,800
*Area of road allowances . . . . .	973,000	1,464,000	1,276,500	3,713,500
Area of parish and river lots . . . . .	505,200	82,500	118,600	706,300
Area of Indian reserves . . . . .	433,860	1,119,454	1,367,974	2,921,288
Area of Indian reserves surrendered . . . . .	87,560	344,414	302,228	734,202
*Area of water-covered lands (inside surveyed tract) Area now available for entry (includes lands reserved for soldier settlement) . . . . .	4,246,300 4,788,000	1,902,300 4,607,300	2,285,050 15,000,000	8,433,650 24,395,300
Total surveyed area . . . . .	35,455,017	78,836,603	85,147,816	199,439,436

\* Area not available for cultivation.



10 GEORGE V A. 1920

STATEMENT of Land Sales by Railway Companies having

Year.	Hudson's Bay Company.		Canadian Pacific Railway Company.		Manitoba South-western Colonization Railway Company.		Qu'Appelle Long Lake and Saskatchewan Railroad and Steamboat Company.	
	Acres.	Amount.	Acres.	Amount.	Acres.	Amount.	Acres.	Amount.
		\$		\$		\$		\$
1893.....			93,184	295,288	14,164	57,559	1,603	
1894.....	7,526	48,225	43,155	131,628	6,312	28,003	640	
1895.....	4,431	23,209	55,453	176,950	5,623	22,330	2,391	
1896.....	9,299	52,410	66,624	220,360	21,254	88,568	286	
1897.....	10,784	53,277	135,681	431,095	63,800	634,644	2,524	
1898.....	62,000	310,000	242,135	757,792	106,473	363,982	22,534	
1899.....	56,875	274,625	261,832	814,857	58,019	199,558	61,030	178,517
1900.....	70,196	352,631	379,091	1,152,836	133,507	437,449	18,932	53,974
1901.....	52,308	399,804	339,985	1,046,665	59,749	214,953	22,266	74,810
1902.....	269,577	1,412,332	1,362,478	4,440,500	206,411	713,365	39,835	147,365
1903.....	330,046	1,939,804	2,260,722	8,472,250	250,372	699,210	843,900	1,476,900
1904.....	144,857	879,910	857,474	3,516,864	29,522	113,303		
1905.....	139,721	865,905	411,451	2,045,800	80,342	296,936		
1906.....	236,191	1,863,375	1,012,322	6,015,060	83,418	360,889		
1907 (9 months to March 31).....	69,158	742,221	851,083	4,817,682	3,051	22,645	1,353	16,789
1908.....	21,184	267,215	81,060	727,367	31,982	153,007	5,621	68,869
1909.....	25,449	288,836	29,331	383,390	10,396	84,845	37,662	380,371
1910.....	104,382	1,297,454	655,583	10,473,425	14,501	126,950	106,000	964,600
1911.....	267,038	3,747,768	715,095	10,372,661	20,313	284,859	113,533	1,237,204
1912.....	42,554	808,943	855,280	12,420,488	18,932	117,497	35,213	495,116
1913.....	53,581	1,128,806	447,158	6,348,352	2,768	48,639	15,395	255,399
1914.....	26,292	572,837	263,962	4,242,089	7,626	91,948	1,629	21,546
1915.....	16,400	306,550	151,262	2,496,872	489	5,508	1,292	19,118
1916.....	79,310	1,273,144	242,215	3,670,421	4,780	58,808	12,246	180,361
1917.....	254,941	4,234,244	405,764	6,612,040	12,470	165,245	21,533	331,596
1918.....	386,394	6,914,947	545,235	11,044,883	25,933	321,005	49,723	783,062
1919.....	285,561	4,978,950	602,555	10,580,669	5,289	67,214	33,838	527,670
Total .....	3,056,055	35,037,422	13,367,222	113,708,234	1,277,496	5,378,819	1,450,979	7,213,267



## SESSIONAL PAPER No. 25

## Government Land Grants, and by the Hudson's Bay Company.

Calgary and Edmon- ton Railway Com- pany.		Canadian Northern Railway Company.		Great Northwest Cen- tral Railway Company.		Total.		Average per acre.
Acres.	Amount.	Acres.	Amount.	Acres.	Amount.	Acres.	Amount.	
	\$		\$		\$		\$	\$ c.
11,260						120,211	352,847	2 93
11,035						68,668	207,856	3 02
46,815						114,713	222,489	1 94
10,553						108,016	361,338	3 34
9,436						222,225	719,016	3 23
15,481						448,623	1,431,774	3 18
24,738	53,335					462,494	1,520,792	3 28
46,653	128,256					648,379	2,125,146	3 27
116,719	352,037					621,027	2,088,269	3 36
323,494	1,033,396					2,201,795	7,746,958	3 56
231,800	909,600	183,736	631,503	128,435	522,490	1,229,011	14,651,757	3 46
129,007	563,507	64,469	313,575	41,858	177,081	1,267,187	5,564,240	4 39
109,191	512,898	231,707	1,221,469	17,593	103,564	390,065	5,046,572	5 09
85,784	480,063	204,966	1,014,351	20,603	137,503	1,642,684	9,871,241	6 01
59,515	346,064	289,576	1,711,109	4,023	41,470	1,277,759	7,697,930	6 02
8,606	75,644	196,946	1,746,504	1,294	13,855	346,693	3,052,461	8 80
6,370	66,508			165	7,935	109,373	1,211,885	11 08
18,323	182,926	285,428	2,783,010	571	6,863	1,184,790	15,835,228	13 36
11,820	116,231	277,414	3,336,797	1,438	27,417	1,406,651	19,122,937	13 59
10,853	154,424	365,926	4,216,578	632	11,373	1,329,390	18,224,419	13 70
4,155	44,212	182,491	2,009,642	1,601	32,105	707,149	9,867,155	13 95
19,575	460,129	182,491	2,009,642			501,575	1,398,191	14 75
23,012	444,018			316	6,965	192,801	3,279,031	17 01
11,689	172,033			4,646	81,182	354,886	5,435,949	15 32
33,821	53,875	17,796	298,938	8,829	141,439	755,154	12,357,377	16 35
53,355	815,628	39,546	732,351	16,021	275,724	1,116,237	20,887,600	18 71
31,774	479,496	65,110	1,261,963	14,530	252,774	1,038,657	18,148,736	17 47
1,461,844	7,964,280	2,587,602	23,287,432	261,955	1,839,740	23,466,153	194,429,194	8 28



10 GEORGE V, A. 1920

## THE DOMINION PARKS.

The outstanding feature with regard to the Dominion parks during the past season was the marked increase in travel by motor. In the parks accessible only by railway there was a noticeable decrease in the number of visitors but the three parks accessible by motor roads had a very successful season. Buffalo and Waterton Lakes parks showed an increase of almost one hundred per cent while Banff, owing to the large influx of motorists, had at times as many visitors as it could accommodate. More than 2,300 cars registered at the park gate on the Calgary-Banff road carrying, it is estimated, 10,000 people, while the figures for Waterton Lakes park were 9,000 and for Buffalo park over 7,000. One of the most gratifying developments in this connection is the fact that the people of the western provinces are now increasingly taking advantage of the wonderful recreation facilities of the National Parks.

Important agreements vitally concerning National Parks were made with the Provinces of British Columbia and Alberta. Both definitely settled long outstanding matters in regard to which there had been conflicts concerning jurisdiction as between the Dominion and the Provinces. The agreements will contribute materially to the satisfactory and efficient administration of the National Parks.

By the British Columbia agreement the Dominion receives from the Province a ten-mile strip—aggregating about 628 square miles—along the Banff-Windermere highway for Dominion Parks purposes. The Dominion undertakes in that connection to complete within four years the construction of the Banff-Windermere highway. The completion of this highway will provide a "Circle" automobile tour of 500 miles largely through the most spectacular scenery of the Rockies. It is anticipated that this highway will attract thousands of automobiles from every part of the continent and thus each year bring millions of dollars into Canada.

Now that the war is over the active development of National Parks work promises to attract a huge foreign tourist traffic, to the great financial advantage of the Dominion.

Substantial progress was made in regard to the administration of the new Northwest Game Act and the year saw the entire fur trapping and trading industry of the north put under license and control.

An organization scheme was also developed for carrying out Canada's obligations under the Migratory Birds Treaty with the United States.

## WATER-POWERS.

Last year attention was directed to the steps being taken to mobilize the water-power resources in preparation for the reconstruction period following the war. During the past year several important forward steps have been taken foremost amongst which was the formation of the Dominion Power Board for the correlation of data and the evolution of a master power policy designed to secure the best economic use of power and fuel resources throughout the Dominion.

In connection with purely water-power matters considerable constructive progress has been made and the preparation of a Water Power Bill to replace Section 35 of the Dominion Lands Act is a step of the first importance. It was found that more extensive and definite authority was required to make the administration of water-power under control of the Minister of the Interior effective than the existing legislation supplied; a new bill was therefore prepared to obtain unquestioned authority for water-power regulations.

The water-power regulations at present effective cannot be considered entirely satisfactory and during the past few years the Dominion Water Power Branch has been carrying on an extensive study into water-power legislation and administration in foreign and other British jurisdictions. With the return of peace it has been pos-



## SESSIONAL PAPER No. 25

sible to secure printed laws and regulations from other countries which during the war were unobtainable, the translation and study of these is now in progress and it is expected that during the coming year a new set of regulations embodying the most enlightened thought of the day will be completed.

The effective co-operation of this department with other Federal and Provincial departments has been very satisfactorily maintained during the past year and in many cases very materially extended. Special mention may properly be made of the relations established with the Imperial authorities investigating Empire water-power resources; these have been instrumental in securing publicity concerning Canadian Water Resources throughout the English-speaking world.

## NATURAL RESOURCES.

The free Dominion lands suitable for cultivation are quickly disappearing. In the past most of the inquiries received by the department related to lands in Western Canada and to meet these requests various reports and maps have been published from time to time. Latterly, however, there has been a growing demand for literature pertaining to the Central and Eastern Provinces of Canada and since the signing of the armistice the inquiries respecting their natural resources have increased tremendously.

The number of settlers and returned soldiers that are attracted by the possibilities of the more northerly areas of the Prairie Provinces continues to be large. The present situation in these regions is briefly summarized below:—

## NORTHERN ALBERTA AND THE MACKENZIE BASIN.

Since Edmonton has been connected by rail with Athabaska, McMurray, Peace River, Spirit River and Grande Prairie, settlement has been gradually expanding in all directions.

In those areas north of the fifty-fifth parallel of latitude that have been specially reserved for returned soldiers by the department, settlers seem to favour the Grande Prairie, Peace River, Waterhole, Pouce Coupé, Spirit River, McLennan and High Prairie districts. With its excellent pasture grounds Northern Alberta has a great future in the raising of live stock and thanks to the prevalence of the dry warm chinook winds the snow never attains a great depth and consequently disappears very early in spring.

The mineralogist and prospector have been attracted by the mineral possibilities, but as is only natural in a country much of which is still far removed from transportation facilities, exploration so far has been very limited. Lode gold, iron and nickel ores have been discovered on the shores of lake Athabaska but there are no deposits of economic value under present conditions. In the foothills north of the Grand Trunk Pacific railway a coalfield extends from township 49, range 27, west of the 5th meridian in a northwesterly direction to township 59, ranges 7, 8 and 9, west of the 6th meridian. The coal is high-grade bituminous and at least one seam on Smoky river may be classed as anthracite. A great many seams are also exposed in the canyon above Hudson Hope, but only a few exceed 3 feet in thickness. Gypsum has been found in the valleys of the Peace, Slave and Mackenzie rivers. The deposits most likely to prove of commercial value are those occurring on Peace river and in the escarpment to the west of Slave river. Some beds of gypsum 20 to 60 feet in thickness are exposed for fifteen miles on Peace river at Peace Point.

Tremendous possibilities confront Alberta in the discovery of the latent petroleum resources. On the Mackenzie basin an exceedingly large area of possible oil-bearing country has never been explored. Drilling operations were unfortunately hampered by the exceptionally bad weather in 1919 but the work of the great oil companies will



10 GEORGE V, A. 1920

be watched with the closest interest during the coming year, especially any work that may be carried out at Great Slave lake and at Fort Norman on the Mackenzie river.

Among other assets of this northern region must be mentioned the great fresh-water fishing areas. The commercial fisheries already established at lakes Athabaska, Lesser Slave and la Biche are making excellent progress in their output of pickerel, pike and tullibee (whitefish). Great Bear lake which is abundantly stocked with varieties of fish far superior to those found in any of the other northern lakes, is still untouched.

#### NORTHERN SASKATCHEWAN.

In northern Saskatchewan explorations and investigations have not been carried out to the same extent as in Northern Alberta. Work that will prove invaluable has already been accomplished by the Forestry and Dominion Water Power Branches. In those districts likely to be settled within the near future the power possibilities of the more important rivers such as the North Saskatchewan, Saskatchewan, Sturgeon-weir and the Churchill are being carefully examined with a view to making a satisfactory computation of the water-power prospects in this part of the Dominion.

Valuable timber is situated northwest of Prince Albert. There are also mineral possibilities in these northern areas but no systematic exploration has yet been undertaken. Nickel and copper sulphides occur at the east end of lake Athabaska but they are not of sufficient importance to warrant their present exploitation. Gold has been discovered in quartz veins at Amisk lake but there has been practically no development work. The undoubted existence of copper and gold in the adjoining territory in northern Manitoba augurs well for their discovery in northern Saskatchewan.

These unexplored regions have most useful resources in furs, game and fish. The fur-bearing animals contribute annually over \$1,000,000 to Saskatchewan trappers, and commercial fishing is now carried on in many lakes of which Ile à la Crosse, Doré, la Plonge, la Ronge and Buffalo are some of the most important.

#### NORTHERN MANITOBA.

In a country that is rather remote from any large centres of population the greatest incentive to its rapid development lies in the chance of discovering very rich gold quartz or other precious minerals.

In Northern Manitoba the Canadian mining world has recently been stirred by events that make one recall the early Klondike days. Allusion is made to the gold discovery late in August, 1919, at Copper lake, which has been declared by reliable mining experts to be rich. The district stretching from lake Athapapuskow and the Saskatchewan boundary on the west to Wekusko or Herb lake on the east, about 100 miles in all, has already firmly established itself as a great mineral area. There are the gold-bearing quartz veins of Wekusko (Herb) lake and the rich copper sulphide deposits of Flin Flon and Schist lakes. In all the history of mining there has probably been no parallel to the achievements of the famous Mandy Mining Company at Schist lake. This company, during the war, was enterprising enough to haul the wonderfully rich copper ore 40 miles by teams, then ship it 125 miles by boat and barge to the Pas and from there it had to be taken 1,200 miles by rail to the smelter at Trail, British Columbia.

In order to encourage the raising of reindeer in the north lands of Canada a tract of 75,850 square miles was specially reserved in July, 1918, for their domestication. This tract extends from Churchill river in northern Manitoba as far north as the sixty-first parallel of latitude and is bounded on the west by Reindeer river and lake and the one hundred and second parallel of longitude, and on the east by the Hudson bay. Permits for free grazing privileges for reindeer are procurable through the department. A question that is at present engaging the attention of a recently



## SESSIONAL PAPER No. 25

appointed commission is the domestication of the musk ox, and if this is at all feasible, those regions of northern Canada that have so often been misrepresented as barren, will be the means of furnishing man with abundance of excellent food and clothing.

## UNCULTIVATED LANDS.

In view of the gradual exhaustion of Dominion lands suitable for agriculture and the advisability of extending settlement, wheresoever possible, in those areas not too far removed from the railroads, the department has prepared lists of lands that are now in private ownership but are not being cultivated owing to the non-residence of the present holders. These lists which contain the names and addresses of the owners of such unoccupied and uncultivated lands, have been prepared, after a considerable amount of work, for the provinces of Manitoba, Saskatchewan, Alberta, Nova Scotia, New Brunswick and Prince Edward Island. Maps also have been published illustrating the exact location of such lands in Western Canada. Though these lists and maps are inevitably incomplete they have been extremely useful in meeting the requirements of those wishing to purchase good agricultural land in a more or less settled environment. With the co-operation of the Department of Immigration and Colonization in the circulation of these lists in the United States and Canada it is expected that many intending settlers will be enabled to communicate directly with the owners of the lands they particularly desire.

The unoccupied lands that have been listed up to the present involve an area of nearly 33,000,000 acres allocated as follows:—

Province.	Acres.
Prince Edward Island.. . . . .	40,671
Nova Scotia.. . . . .	192,806
New Brunswick.. . . . .	166,876
Manitoba.. . . . .	2,448,000
Saskatchewan.. . . . .	16,617,030
Alberta.. . . . .	13,286,760
	<hr/>
	32,752,053

The acreage of the unoccupied and uncultivated lands in the other provinces of the Dominion is not included in the above table, but the work necessary for its determination and the preparation of lists in connection therewith has already been commenced.

The advantages that will ultimately accrue to the Dominion of Canada by the cultivation of a large portion of these 33,000,000 acres will be readily understood when it is borne in mind that in 1919 the total area under field crops was only 51,155,597 acres.

## EASTERN CANADA.

Owing to the very varied nature of the inquiries received from Western and Eastern Canada and the United States in regard to the resources of the eastern portions of the Dominion, the department has found it expedient to give greater facilities for the acquiring of information relating to these resources which are now keenly interesting the American capitalist and investor. By the investigation of problems relating to the development of Canada's natural resources and the circulation of the results of such research in reports, bulletins, news items, magazine articles and lantern slide lectures it is hoped to diffuse a much wider knowledge of the Dominion throughout England, Canada and the United States and incidentally to place industrial interests in touch with the proper recognized authorities for any information they may wish to ascertain. The department is co-operating with the other Federal departments and with the Provincial Governments in this matter.



10 GEORGE V, A. 1920

## THE DOMINION OBSERVATORY, OTTAWA.

During the fiscal year 1918-1919 observations with the meridian circle were obtained on 125 nights; they were devoted in part to determinations of clock error for the time service and for longitude work, and in part to a continuation of work on the list of latitude stars mentioned in previous reports; a series of observations was also made on the new star in Aquila, for determination of its position. Two observers were engaged throughout the year and a third for a part of the year.

Field observations for latitude and longitude were carried out at two stations, Ste. Anne des Monts, Quebec, and the Pas, Manitoba. The longitudes were determined directly from Ottawa by electric telegraph, the latitudes by Talcott's method.

The time service has been maintained as in previous years. There are now nine secondary master-clocks synchronized continuously from the Observatory; these in turn control 384 clocks and dials of various kinds, including the tower clock at the Observatory and the city post office. In addition, relays beating seconds are maintained in two offices in the city, one clock is synchronized every hour; time signals are sent out by telegraph and telephone, and the time is recorded on the various seismographs at the Observatory. A comparison is made daily with Washington time by means of the wireless time-signals sent out by Arlington; a small systematic difference is present, which may be due to lag in the Arlington transmitting apparatus. A test is in progress of various box chronometers under different temperature conditions, mainly for testing and possibly improving the temperature compensation.

The Equatorial Telescope was utilized as heretofore for the purpose of obtaining radial velocities of stars. A total of 241 spectrograms were taken, each of which represents an exposure of approximately 90 minutes.

The orbits of 5 spectroscopic binaries were determined and the work on them compiled for publication. Also a number of plates of various stars were taken and measured. The measures of fourteen of these stars whose velocities were considered constant were compiled and will appear in a later publication. A large number of spectrograms were obtained of the star that blazed forth on June 8, Nova Aquilæ No. 3, an object of universal astronomic importance. An exhaustive study was made of its spectrum and the successive changes therein.

The telescope was placed at the service of the public as usual on Saturday nights, and a large number of visitors availed themselves of the opportunity for viewing the heavens.

With the enlarging camera of the equatorial telescope, now equipped with graduated circle and vernier reading to tenths of a degree (so that the lines of the directions of the solar axis and of the diameter at right angles to it are indicated from day to day, as well as the "East-West" line) 57 photographs registering sun-spots, were made.

The 24.5 m. coelostat reflecting telescope and 7 m. grating spectrograph have been utilized as formerly in observing spectra of the sun—center of disc, limbs and points intermediate—along with iodine absorption spectra and arc emission spectra, 9 strips of spectra being photographed at each observation. In all 263 plates were made, comprising 1,160 observations, covering the problems of solar rotation, convection, pressure, distance and the still doubtful Einstein gravitational effect on the wave-lengths of solar spectrum lines.

To obtain the International standard electric arc a 220-volt, D.C. generator has been installed.

The continued observation of the Solar rotation, by spectroscopic methods, will undoubtedly prove of great value in unravelling the causes of meteorological variations and their sequences which are so important to mankind.

Photometric work has been continued with the photographic telescope as in the past years. Exposures have been made on almost every fine night except when there



## SESSIONAL PAPER No. 25

was moonlight. 121 plates with about 250 exposures were obtained. The Nova has been closely followed; unfavourable weather conditions prevented the finishing of observations on several stars on the regular programme.

Work in connection with the magnetic survey of Canada carried on by the Observatory was continued during the year. There are now about 500 stations distributed between the Straits of Belle Isle and Prince Rupert on the Pacific Coast, at each of which the magnetic elements of declination, inclination and intensity have been observed. For the first—declination—or variation of the compass, there is much public demand. The past season was devoted to again observing at some “repeat” stations from Sydney to Winnipeg, 38 in number, to determine the secular variation or annual change, necessary for the reduction of all observations to a common epoch. It is planned to publish all the magnetic data with accompanying maps covering the whole of Canada, for which there are frequent requests.

The three seismographs have been in constant operation as well as the deformation instrument for the measurement of the tides of the solid earth. During the fiscal year 137 earthquakes were recorded in different parts of the earth, as no severe earthquake fails to be recorded at Ottawa. The records of the seismographs at Halifax and at Saskatoon, belonging to the Observatory, are of much value combined with those of Ottawa in the accurate location of earthquakes in the ocean or in uninhabited parks.

The undagraph at Chebucto Head, N.S., by which every ocean wave is recorded and correlated with the tremors of such waves through the earth by the seismograph continues in active operation.

As heretofore monthly bulletins of the earthquake records are issued and distributed amongst the principal earthquake stations of the world. It may be of historic interest to note that the abdication of the Kaiser on the 9th of November and the Armistice two days later were recorded on both photographic seismographs.

Gravity observations have for the time being been discontinued as no observer was available.

Several series of experiments were carried out to determine the exact amount of the variations in the frequency of the city electric light circuit. This is of interest in view of the possibility of operating a general time service from the light circuit, the generators in the power house being properly synchronized. This would mean that by simply making a connection with the ordinary light circuit and a suitable dial, accurate time could be obtained in any household where there is electric light.

## DOMINION ASTROPHYSICAL OBSERVATORY, VICTORIA, B.C.

The first work of this institution commenced in May, 1918.

The mounting of the telescope was finally erected in October, 1916, and the observatory building was completed about the end of the same year. The mirror and other optical parts were, however, not ready, the delay being principally due to difficulties in the way of obtaining a testing place. It was confidently expected that the work would be finished in the early summer of 1917 and consequently the director and assistant astronomer moved from Ottawa in July, 1917, to do the considerable necessary preliminary work required in preparation for the regular observing programme.

The mirror was nearly finished in August and again in October, but in both cases the work in one part of the surface was carried slightly too far, necessitating considerable repolishing and refiguring. It was not until April 3, 1918, that the figuring was finally completed, tested and accepted. In the meantime the spectrograph had been completed, arriving in Victoria in December, 1917. It was attached to the telescope, tested, adjusted, and the dispersion tables required for its use were prepared.

The principal mirror and other optical parts were shipped from Pittsburgh in a through express car, reaching Victoria on April 29, 1918. As all the preliminary work



10 GEORGE V, A. 1920

had been carefully attended to, the mirror was quickly installed and collimated, and the first star spectrum was photographed on May 6.

Between that date and March 31, 1919, 1,729 star spectra have been obtained on 143 nights. In addition the telescope was used for direct photography and for miscellaneous experimental work on 20 nights additional, making 163 nights on which observations were made during an interval of 329 days. Many of these nights were broken and interrupted by clouds and on some only one or two plates were obtained. The "seeing" generally was good and the first year's work with the telescope has shown that the climatic conditions at Victoria are even better than was expected.

The definite programme under observation of which these spectral plates constitute a part, consists of a list of some 800 stars from about 5.5 to 8.0 magnitude whose radial velocities are to be determined. This list was selected from those stars in Boss's Preliminary General Catalogue which are north of the equator and whose velocities have not been previously determined. It was compiled in co-operation with the Mt. Wilson Observatory, where the velocities of a number of the Boss stars had already been obtained with a spectrograph attached to the 60-inch reflector and where the instrumental capacity will shortly be largely increased by the addition of the 100-inch reflector. By this co-operation duplication of work is reduced to a minimum and the velocities of all the stars in the Boss Catalogue, especially important as their proper motions are known, within reach at the two observatories will be obtained in the shortest possible time.

In the measurement of the spectra of stars in this list, 54 spectroscopic binaries were discovered, stars whose velocity when reduced to the sun was found to vary, thus indicating duplicity of the systems and showing that the stars whose spectra were visible were revolving around companions so close together as to be impossible of separation visually.

In addition to and partly complementary to the main spectroscopic work on the programme, the orbits of the spectroscopic binaries, Geminorum and Boss 8170 were determined. Further work was done and important results obtained from the spectroscopic binary 12 Lacertae, and a large number of spectra were obtained of Nova Aquilae No. 3, the brightest nova that has appeared since the spectroscope has been applied in stellar work. Many of these spectra were measured and interesting and useful information obtained.

In addition to the main programme of spectroscopic observations, the telescope was, as previously stated, employed on 20 nights in the direct photography of stars, clusters, and nebula. Many of the resulting photographs were in the nature of experimental trials to determine the best adjustment of the instrument and in preparation for an investigation, for obtaining the magnitudes of the faintest stars in selected regions of the sky. However, a number of direct photographs of star clusters and nebulae were obtained, sufficient to clearly show the high quality of the optical parts. The star images on these plates are remarkably sharp and well defined, the minimum diameter in good seeing being only slightly over one second of arc which at the focus of the 72-inch telescope is about one six-hundredth of an inch.

In connection with the direct photography, a complete investigation of the quality of the 72-inch mirror and also of the Cassegrain combination was made under varying temperature conditions by means of the Hartmann extra-focal method and the aberrations or departures from theoretical perfection of thirteen zones, two inches apart, of the surface were measured. Under constant temperature conditions the maximum longitudinal aberration at the principal focus is less than one-fourth of a millimetre, indicating a remarkably fine figure, but this was increased to more than three millimetres when the daily swing of temperature change at Victoria was only slightly above the average. These results indicated the necessity of protecting the mirror as far as possible from the daily change, which was effected by completely encasing the closed section of the tube in a felted cotton covering, with a thick blanket cover at the top,



## SESSIONAL PAPER No. 25

removable when observing. The change of temperature within this covering and around the mirror was reduced to about one-third of that in the dome and consequently rarely exceeds three of four degrees Fahrenheit. By this means the aberration due to temperature change was reduced to about one millimetre, an amount well within the disturbance caused by atmospheric tremor even under good seeing conditions.

The performance of the telescope mechanically, is also very gratifying and the whole equipment for convenience and accuracy of working leaves nothing to be desired. I have no hesitation in stating that this installation, not only in size, but in perfection of design and workmanship and in ease and facility of handling, is far in advance of any existing telescope.

## RECLAMATION.

## DRAINAGE.

Owing to the increasing importance of the work relating to drainage which had been performed by the Irrigation Branch, it was considered advisable to supercede that Branch of the Department by the Reclamation Service. The underlying cause for increased drainage activity was the removal, by legislation, of apparently conflicting interests between the Federal Government and the Governments of the provinces of Alberta and Saskatchewan regarding drainage problems. The solution was found in a compromise which is proving eminently satisfactory to both sides. The Government of Manitoba has not up to the present passed legislation to enable it to benefit by the new arrangement but it is anticipated that action in this direction will soon be taken.

## IRRIGATION.

The year 1918 was perhaps the driest on record and following, as it did, an exceedingly dry year, there was practically no moisture in the soil and crop failure was the result in most localities.

The recurrence of a number of dry years has forced upon the farmers of the semi-arid region the conclusion that it is unsafe to depend upon the natural fertility of the soil and rainfall alone but that irrigation is essential if crops are to be assured. That this lesson has been well learned is evidenced by the largely attended meetings held last winter and spring, as well as by the formation of Irrigation districts and an Irrigation district association in Alberta. Unfortunately, there is only sufficient water available to irrigate about 10 per cent of the land requiring irrigation and plans for development must be limited by a consideration of this fact.

## IRRIGATION SURVEYS.

As war conditions made necessary a general policy of retrenchment, no large survey parties were maintained in the field. A reconnaissance was made in connection with the Lethbridge Northern Project to determine the feasibility of extending the canal system as originally planned to serve land in the Sundial District and it was found that this area might be included at a slight additional cost per acre for the whole project.

## HYDROMETRIC SURVEYS.

In order to economize, only the most important hydrographic work was undertaken and a number of the engineers combined irrigation inspection duties with stream measurement. The records obtained are exceptionally valuable as they show the conditions to be expected in an abnormally dry season.



10 GEORGE V, A. 1920

## WATER SUPPLY INVESTIGATIONS.

Investigations were continued into the question of domestic and stock water supply and considerable data has been gathered which will be valuable for use in bettering conditions. As a result of this investigation a number of cancelled stock watering reserves have been rehabilitated in the interest of the Better Water Supply scheme for Alberta.

## MINING, ETC.

Very pronounced activity has been shown during the year in prospecting and mining, particularly in the northern portions of Manitoba and Saskatchewan. In Manitoba there are three mineral districts in which rich deposits of gold, silver and copper sulphide have been found, and active mining operations are being conducted at several points. Ore is being shipped in considerable quantities from The Pas District, notwithstanding the adverse conditions due to the absence of railway transportation. This ore is hauled 40 miles by team, is carried 125 miles by barge, and is transported over 1,200 miles to the Trail smelter in British Columbia, being handled several times in transport. Only marvellously rich ore could stand such treatment.

Boring operations for the discovery of petroleum and natural gas are being actively prosecuted in Alberta and British Columbia with very gratifying results. Over 15,000 leases of such rights have been granted, and discovery has been made at different points of natural gas in large quantities, which is being used for domestic and commercial purposes, as well as petroleum in considerable quantity. Three separation plants have been erected in the Okotoks District, and the production during the past year from that field was approximately 14,000 barrels of 42 gallons each. In the Peace River District a large number of wells are being bored, and it is confidently expected that before the close of the present year oil in commercial quantity will be found. An absorption plant has been erected at Calgary for the extraction of gasoline from the wet gas produced in that part of the Province, which it is predicted will materially increase the aggregate output.

## FORESTRY.

The policy of economy followed during the war was continued in the work of the Forestry Branch throughout the year. No new lines of work requiring large expenditure were opened up. The summer season was not a specially dangerous one for fire and the expenditure on the work of fire fighting was comparatively low and the loss from fires small. The fire situation in Manitoba has been much improved by the legislation requiring the taking out of permits before setting out fire for the clearing of land. Similar legislation was passed by the province of Saskatchewan but no provision was made for an organization to carry out the law. The province of Alberta has not yet passed such legislation. The following are the most important causes of fire, in order of their importance: unknown, settlers, railways, campers and travellers.

The work on the forest reserves has been carried on with satisfactory results. Improvements for the protection and administration of the reserves have been continued. These include houses, cabins, roads, trails, telephone lines, lookout towers, etc.

Of special importance was the considerable increase in the timber operations on the reserves during the year. This increase was due in part to the high cost of lumber and of fuel. Timber operations are carried on with more care in regard to protection against fire and the reproduction of the forest, as the operators are gradually becoming educated in this respect.

During the last few years there has been remarkable development in the use of the forest reserves for grazing, as the stock owners have come to appreciate the value



## SESSIONAL PAPER No. 25

of the range; and during the past season the number of stock grazed was more than double the number grazed the previous year. This large increase was partly due to the serious feed situation in Southern Alberta resulting from dry weather, when about 25,000 head of stock were tided over the crucial period by being taken into the reserves.

The regulations for grazing give special consideration to the small owner and are framed to make the forest resources available to the largest number of people possible. This policy has led the settlers to organize themselves into stock or grazing associations which is proving the best means of utilizing large areas.

The increasing demand for grazing privileges has made it necessary to have more exact information in regard to the resources on the reserves, and a start at this work has been made in Alberta, grazing reconnaissance surveys being made on several of the reserves.

The forest survey of the plot set aside for a forest experiment station on the military reservation at Petawawa, Ontario, was nearly completed and several sample plots have been set apart for special study. These plots, which are excellently situated for the study of typical pine and spruce areas, will in time give valuable information in regard to the development of stands of various compositions under different conditions of soil, light, and moisture.

On representations made by the Imperial Munitions Board a branch of the Forest Products Laboratories was established at Vancouver for testing airplane timbers. This laboratory will later develop more general studies of British Columbia woods.

Several important bulletins were issued during the year.

W. W. CORY,  
*Deputy Minister.*







PART I.

DOMINION LANDS







# DOMINION LANDS

## REPORT OF THE COMMISSIONER, J. W. GREENWAY.

	To March 31, 1918	To March 31, 1919
Applications for Patent		
Number examined: . . . . .	45,752	33,573
New applications . . . . .	20,233	16,791
Applications accepted and notifications sent out . . . . .	19,332	11,246
Certificates of recommendations sent out . . . . .	.....	4,706

## REPORT OF THE CHIEF INSPECTOR OF DOMINION LAND AGENCIES, H. G. CUTTLE.

During the year I have held a great many investigations in connection with Dominion Lands, many of which were under oath authorized by Order in Council.

I visited most of the Land Offices in Manitoba, Saskatchewan, Alberta, and British Columbia during the year, and found it necessary to recommend the appointment of an auditor, which was done in January of this year. The general condition of the offices was good and the staffs much better equipped to handle seed grain and other collections than in former years.

During the past year the entire seed grain and relief distribution and collections have been added to my office, and a great deal of extra work was caused by the winding up of the seed grain distribution for 1918, but I am pleased to be able to report that this is now in good order and the work in this department up to date.

In referring to the seed grain collections for the past year, I beg to say that the amount collected was approximately \$1,307,513.33, which I consider very good when the fact that such a large proportion of the crop was a total loss owing to the early frosts and drought. The total amount collected to March 31, 1919, is \$9,201,601.84.

In referring to the seed grain distribution for the present season, I would say that up to the present time applications for seed have been approved for 149,001 bushels wheat, 154,545 bushels oats and 5,521 bushels of barley. This was on the applications of 3,418 settlers, and 10 of these have since cancelled their applications, having made other arrangements for procuring same, amounting to 359 bushels wheat, 642 bushels oats, and I expect that six or seven hundred more applications will have to be dealt with before the close of seeding.

Two Homestead Inspectors are also attached to my office. Their duties are the taking of applications for patent in districts not served by sub-land offices and a great benefit has been derived by the settlers from their work, several hundred applications having been taken by them. They also hold special investigations into seed grain and other matters.

The new auditor, during the past two months, has made special audits of the land offices at Moosejaw, Swift Current, Saskatoon and Edmonton. Many things which required adjustment were found and I am pleased to report that a marked improvement is already shown in the general conduct of these offices.



REPORT OF THE INSPECTOR, O. NEFF, OF DOMINION LAND AGENCIES, MOOSOMIN, SASK.

Agency.	Home- stead entries granted.	Land Sales.			S. A. Scrip.	Appli- cations for Patent re- ceived.	Land Entries Can- celled.	Permits Issued.	
		Ordin- ary and School Lands.	Preemp- tions.	Pur- chased Home steads.				Timber.	Hay.
Battleford . . . . .	142	29		55		746	453	201	977
Dauphin . . . . .	424	35				332	237	556	665
Moosejaw . . . . .	206	24		126		3,060	223	1	1,236
Prince Albert . . . . .	535	51		6		749	284	856	948
Saskatoon . . . . .	123	68	1	189		1,568	169	101	1,146
Swift Current . . . . .	187	15	3	134	1	5,962	283	152	985
*The Pas . . . . .	1	1						47	35
Winnipeg . . . . .	389	64				715	453		
Total . . . . .	2,007	287	4	510	1	13,132	2,102	1,914	5,992
Compared with 1917-18.	4,323	414	569	128	5	13,246	3,326	1,422	6,288
Compared with 1916-17.	6,714	359	1,010	157	1	13,351	4,571	1,367	6,235

\*The Pas Agency was closed Feb. 18, 1919, and a sub-agency and mining recorder's office opened.



## SESSIONAL PAPER No. 25

## DOMINION LANDS SUB-AGENCIES—Manitoba and Saskatchewan.—Work Performed during the Departmental Year ending March 31, 1919.

Name.	Sub-Agency.	Applications for			Applications for		Applications for	
		Home-steads.	Pur-chased Home-steads.	Preemp-tions.	Patent.	Ins-pection.	Timber permits.	Hay permits.
T. G. Ross .....	Assiniboia .....	43	3	.....	495	58	5	146
Mrs. M. Bucke.....	Brandon.....	15	.....	.....	12	7	.....	4
J. Cusack.....	Empress.....	11	.....	.....	449	18	5	26
Wm. Banks .....	Gull Lake.....	8	.....	.....	402	30	.....	26
J. S. Wiebe.....	Herbert.....	3	.....	.....	7	10	.....	20
A. Reid .....	Kerrobert.....	4	.....	.....	176	3	.....	55
J. H. Elliott.....	Kindersley .....	4	.....	.....	151	5	.....	24
W. H. Holland.....	Lloydminster.....	16	1	.....	47	14	6	55
C. H. Stockdale.....	Maple Creek .....	9	.....	.....	616	16	81	137
J. McCordie....	Meadow Lake. ....	22	.....	.....	13	10	17	74
A. Featherstonhaugh..	Macklin.....	.....	.....	.....	3	1	.....	.....
W. Young .....	Melfort.....	82	1	.....	163	22	15	31
J. Deans .....	North Battleford. ....	44	.....	.....	75	34	25	156
J. McGurrae.....	Nokomis .....	8	.....	.....	47	7	.....	20
W. Giroux .....	Ponteix.....	39	.....	.....	817	46	.....	3
D. McMurphy.....	Preeceville....	30	.....	.....	190	20	5	46
V. W. Johnston.....	Rosburn.....	1	.....	.....	.....	.....	.....	.....
B. T. Tucker .....	St. Rose du Lac....	30	.....	.....	9	6	4	44
J. H. Canham.....	Sprague .....	8	.....	.....	2	.....	1	5
E. M. Reid.....	Swan River....	4	.....	.....	6	9	1	8
J. W. Hanger.....	Shellbrook.....	17	.....	.....	119	13	56	12
D. Hughes. ....	Turtleford.....	26	.....	.....	64	32	11	34
Wm. Buxton.....	Tisdale .....	148	1	.....	151	50	32	44
F. N. Rowe.....	Wynyard.....	5	.....	.....	55	3	.....	40
T. A. Underwood....	**Weyburn.....	11	.....	.....	49	8	.....	46
J. A. Duncan.....	Yorkton .....	8	.....	.....	51	6	.....	9
W. B. McLellan .....	*The Pas.....	1	.....	.....	.....	.....	4	.....
M. Langstaff .....	Wadena.....	80	.....	.....	113	49	4	59
Total .....	.....	677	6	.....	4,282	477	272	1,124
Compared with 1917-18 .....	.....	1,794	55	254	5,552	1,548	395	1,377
Compared with 1916-17 .....	.....	2,364	72	375	5,850	2,175	418	1,406

\*The Pas—This office was opened February 18, 1919, and the same official is Mining Recorder.

\*\*Weyburn Sub-Agent—J. S. Hamilton from May 14 to August 15. G. Lythgoe, November 6 to November 30. T. A. Underwood, appointed March 5, 1919.



10 GEORGE V, A. 1920

STATEMENT showing principal work performed by Homestead Inspectors in Manitoba and Saskatchewan for Departmental Year ending March 31, 1919.

Name.	Headquarters.	Land ins- pections made.	Apph- cations for patent made.	Miles travelled.	
				Wagon.	Rail.
D. Anderson .....	Battleford...	211	23	5,840	70
A. C. Elliott.....	" .....	180	64	4,568	3,175
T. Martin.....	Dauphin ..	135	77	1,643	5,103
T. Secord....	" .....	140	11	3,023	446
G. L. Speer. .	" .....	152	132	5,106	2,113
J. B. Boucher....	Prince Albert..	155	3	3,567	866
H. Baldwin.....	" .....	203	7	3,816	904
Win Morrison.....	" .....	227	26	3,997	3,305
J. F. McKenzie. ....	" .....	210	2	3,934	2,249
E. J. Hober.....	Moosejaw. ....	160	12	6,533	3,344
A. Hamilton.....	" .....	154	91	3,245	12,230
W. Erratt.....	" .....	270	16	4,816	1,080
C. E. Barr....	" .....	195	73	3,547	5,062
J. A. Balfour. ....	Saskatoon .	102	32	1,801	3,400
A. Smyth.....	" .....	232	62	7,660	7,524
F. M. Collins.....	" .....	108	75	1,960	2,704
A. Henke.....	" .....	210	19	4,568	2,233
A. E. Mosses....	" .....	177	197	5,327	614
Geo. McGowan....	Winnipeg...	469	166	5,424	3,450
W. D. Gillespie.....	" .....	194	63	4,034	3,730
H. L. Mabb.....	" .....	444	124	4,059	2,495
R. Reykdal. ....	" .....	222	41	2,532	1,179
W. Lagimodiere .....	" .....	284	67	3,784	3,879
L. Lepine .....	" .....	179	289	2,370	4,522
P. McLaren.....	Swift Current..	227	52	4,730	3,069
A. L. Roth.....	" .....	33	12	610	1,623
J. Furns.....	" .....	178	41	3,870	275
D. W. Hart .....	" .....	160	77	4,191	135
R. G. Mackey. ....	" .....	96	22	1,492	670
Wm. Shields .....	" .....	64	16	1,152	.....
W. J. Mayberry.....	" .....	63	96	1,492	508
Total.. .....		5,834	2,038	117,491	81,957
Compared with 1916-17. ....		7,001	3,805	136,958	98,678
Compared with 1917-18.....		6,196	3,022	123,914	95,312



SESSIONAL PAPER No. 25

REPORT OF THE INSPECTOR OF DOMINION LANDS AGENCIES,  
J. W. MARTIN, CALGARY, ALTA.

DOMINION LANDS AGENCIES.—Principal Transactions for the Departmental Year ending  
March 31, 1919.

Period.	Home- stead entries granted.	Land sales.			Applica- tions for Patent received.	Land entries cancelled.	Permits issued.	
		Ordinary and school Lands.	Pre- emptions.	Purchased Home steads.			Timber.	Hay.
Calgary.....	220	23	1	1	3,004	288	387	1,153
Edmonton.....	844	87			1,684	926	1,252	1,931
Grande Prairie .....	558	28			383	265	324	368
Kamloops .....	31	26			118	28	339	36
Lethbridge... ..	161	19	4		1,547	190	466	389
New Westminster ...	13	1			19	11		
Peace River .....	384	21			325	140	271	423
Revelstoke ... ..	10	5			14	14	89	
	2,221	210	5	1	7,094	1,862	3,128	4,300
1917-18.....	6,386	347	231	74	7,481	2,920	4,571	2,988



DOMINION LANDS SUB-AGENCIES.—Work performed during the Departmental Year ending March 31, 1919.

Name of Sub-Agent.	Sub-Agency.	Application for.			Application for.		Application for.	
		Home-steads.	Pur. Home-steads.	Pre-emption.	Patents.	Ins-pection.	Timber. Permits.	Hay.
Spicer, S. E.....	Alaska.....	7	.....	.....	478	9	.....	67
Rennison, G. M.....	Athabasca.....	23	.....	.....	56	17	47	113
Carlson, A. W.....	Durlingville.....	54	.....	.....	22	18	10	121
Glover, Frank.....	Edson.....	6	.....	.....	61	7	6	15
Brown, Alex.....	Entwistle.....	9	.....	.....	77	4	24	41
Cusack, John.....	Empress.....	26	.....	.....	523	20	.....	30
McGowan, J.....	Frog Lake.....	16	.....	.....	29	9	8	16
Potts, Cecil.....	Fort McMurray.....	.....	.....	.....	.....	1	.....	1
Barber, J. C.....	Ft. St. John, 11 mo..	16	.....	.....	14	.....	2	2
Morden, A. L.....	Ft. Vermilion, 11 mo..	21	.....	.....	1	5	6	53
Requier, E. E.....	Donnelly.....	29	.....	.....	35	8	63	20
Wenman, Wm.....	Golden.....	4	.....	.....	7	3	20	1
Trenaman, J. C.....	Hanna.....	6	.....	.....	380	16	.....	41
Holland, W. H.....	Lloydminster.....	10	.....	.....	19	5	.....	45
Whitaker, J. M.....	Mosside.....	36	.....	.....	45	6	4	16
Robinson, A. W.....	Medicine Hat.....	31	.....	1	571	39	.....	110
Rogers, M. J.....	Orion, 4 mo.....	2	.....	.....	33	5	.....	15
Saloway, Geo.....	Pouce Coupe.....	68	.....	.....	89	28	45	26
Fleming, W. S.....	Provost, 7 mo.....	10	.....	1	149	9	2	48
McDonald, S. A.....	Pine Creek.....	6	1	.....	59	9	50	17
Hankinson, R. T.....	Ry. Mt. House.....	11	.....	.....	49	19	39	25
Gee, R. C. P.....	Red Deer.....	15	.....	.....	38	11	7	47
Lacey, J. E.....	Salmon Arm.....	5	.....	.....	13	5	3	.....
Gray, W. B.....	Stettler.....	11	.....	.....	151	12	.....	42
Fildes, J. M.....	Spirit River.....	56	3	.....	69	21	69	80
LaPlante, J. R.....	St. Lina.....	45	.....	.....	61	26	19	20
Racicot, B.....	St. Paul des Metis.....	49	.....	.....	80	24	64	107
Mace, Job.....	Vermilion.....	19	.....	.....	144	35	2	55
Todd, H. E.....	Wetaskiwin.....	9	.....	.....	8	15	55	28
McLeod, W. H.....	Wainwright.....	16	1	.....	89	15	9	11
Hughson, W. S.....	Whitford.....	7	.....	.....	41	7	56	2
Alton, B. C.....	Westlock.....	22	.....	.....	85	11	81	101
Wenham, Mark.....	Yeoford.....	9	.....	.....	26	7	3	19
Rayment, M.....	Youngston.....	14	.....	.....	776	38	.....	75
Totals.....	.....	688	5	2	4,288	464	694	1,410
1917-1918.....	.....	1,283	44	100	4,391	1,354	799	1,009



## SESSIONAL PAPER No. 25

STATEMENT showing principal work performed by Homestead Inspectors in Alberta and British Columbia for Departmental Year ending March 31, 1919.

Name of Homestead Inspector.	Headquarters.	Period.	Land In- spections made.	Applica- tions for patent taken.	Miles Travelled.	
					Wagon.	Rail.
Benzie, J. M. ....	Kamloops..		387	25	5,932	1,901
Cunningham, T. J. ....	Edmonton..		185	40	3,985	4,151
Cook, H. ....	Revelstoke.....		139	1	753	4,724
Doze, I. S. ....	Edmonton.....		358	11	3,958	2,110
Fletcher, Jos. ....	Grande Prairie ...		224	1	4,869	
Fleming, G. W. ....	Calgary.....		148	6	6,282	2,298
Griffin, A. H. ....	Edmonton.....		398	35	5,434	2,309
Grasse, P. L. ....	Edmonton.....		173	1	3,361	4,725
Hagen, S. C. ....	Edmonton.....		398	51	4,962	2,534
Horne, J. A. ....	Edmonton.....		248	3	6,718	3,050
Kembry, R. A. ....	Calgary.....		315	16	5,870	2,438
Key, A. E. ....	Peace River. ....		101	13	1,562	3,719
Magee, W. D. ....	New Westminster. ....		92		1,073	3,590
McMullen, J. E. ....	Peace River.....		177	13	3,426	1,885
McConnochie, A. ....	Edmonton.....	1 month	19	1	268	367
McCowan, H. S. ....	Edmonton.....		411	26	2,877	2,691
Newton, T. M. ....	Grande Prairie....	5 months	45		1,901	
Scott, Hugh. ....	Lethbridge ...	7 months	135	20	5,568	708
Switzer, Wm. ....	Lethbridge.....		190	1	5,097	690
Tempany, Wm. ....	Calgary ...		204	13	7,174	4,448
Woodlock, P. A. ....	Calgary.....		351	66	5,471	7,886
Wynne, A. E. ....	Edmonton .....		159	36	4,434	2,200
Totals.....			4,857	379	90,975	58,424
1917-18.....			5,416	614	95,707	61,106



REPORT OF THE AGENT OF DOMINION LANDS, D. J. ROSE.  
BATTLEFORD, SASK.

Statement of business transacted during the fiscal year ending March 31, 1919:—

Land Patents Branch—	Number.	Revenue.	Total.
Homestead fees.. . . . .	142	\$ 1,420 00	
Purchased homestead fees.. . . . .	1	10 00	
Improvements.. . . . .	31	1,818 00	
Land sales, cash.. . . . .	29	2,347 95	
Pre-emption payments.. . . . .	94	28,875 24	
Purchased homestead payments.. . . . .	67	9,686 77	
Searches, map sales, office fees, etc.. . . . .	245	61 25	
Applications for patent received.. . . . .	746		
" " inspection received.. . . . .	106		
Entries cancelled.. . . . .	453		
Sundries, townsite sale.. . . . .	11	213 60	
Total.. . . . .			\$44,432 81
Timber and Grazing Branch—			
Timber permits.. . . . .	199	\$ 308 00	
" seizures, excess.. . . . .	30	148 98	
Hay permits.. . . . .	467	1,149 30	
" excess payments.. . . . .	13	27 30	
Grazing rentals, cash.. . . . .	412	1,972 20	
Total.. . . . .			3,605 78
Forestry Branch—			
Permit fees and rental.. . . . .	290	\$ 421 25	
" " excess payments.. . . . .	3	4 00	
Seizures.. . . . .	1	8 00	
" .. . . .	11	57 85	
Grazing rent, etc.. . . . .	97	1,153 15	
Hay dues.. . . . .	41	189 50	
Total.. . . . .			1,833 75
Mining Lands and Yukon Branch—			
Mining fees.. . . . .	29	\$123 00	
Rental.. . . . .	1	11 32	
Total.. . . . .			134 32
School Lands Branch—			
Timber permits.. . . . .	2	\$ 12 75	
" excess payments .. . . .	2	10 00	
Hay permits.. . . . .	528	1,195 15	
" excess payments.. . . . .	12	24 70	
Grazing rentals.. . . . .	277	3,735 56	
Cultivation permits.. . . . .	2	205 00	
Total.. . . . .			5,183 16
Miscellaneous—			
Seed grain and provision repayments.. . . . .	82	\$7,572 42	
Sundries.. . . . .	1	13 45	
Total.. . . . .			7,585 87
Grand total.. . . . .			\$62,775 69



SESSIONAL PAPER No. 25

# REPORT OF THE AGENT OF DOMINION LANDS, W. E. TALBOT, CALGARY, ALTA.

Statement of business transacted during the fiscal year ending March 31, 1919:—

Land Patents Branch—	Number.	Revenue.	Total.
Soldier grants.. . . . .	90	.....	
Homestead fees.. . . . .	220	\$ 2,180 00	
Pre-emption fees.. . . . .	1	10 00	
Purchased homestead fees.. . . . .	3	30 00	
Improvements.. . . . .	87	5,028 46	
Land sales.. . . . .	23	3,164 06	
Pre-emption payments.. . . . .	1,006	338,085 30	
Purchased homestead payments .. . . .	209	33,779 98	
Searches, etc.. . . . .	354	88 50	
Applications for patent.. . . . .	3,004	.....	
"    "    cancellation.. . . . .	219	.....	
Entries cancelled.. . . . .	288	.....	
Total.. . . . .			\$382,366 30
Seed Grain Branch—			
Seed grain and provision payments.. . .	595	\$83,974 46	
Total.. . . . .			83,974 46
Timber and Grazing Branch—			
Ground rent.. . . . .	26	\$2,602 26	
Royalty on sales.. . . . .	27	6,392 90	
Timber permits.. . . . .	210	4,454 14	
"    seizures.. . . . .	5	299 90	
Hay permits.. . . . .	290	1,476 70	
Grazing rentals.. . . . .	493	7,012 12	
Sundries.. . . . .	14	28 00	
Total.. . . . .			22,266 02
Forestry Branch—			
Permit fees and rental.. . . . .	179	\$10,169 23	
Seizures.. . . . .	8	858 35	
Grazing rent.. . . . .	124	4,520 73	
Hay dues.. . . . .	40	175 75	
Total.. . . . .			15,724 06
Irrigation Branch—			
Sales.. . . . .	2	\$171 65	
Reservoir rental.. . . . .	1	116 90	
Total.. . . . .			288 55
Mining Lands and Yukon Branch—			
Mining fees (quartz and placer).. . . .	36	\$ 85 00	
Rental (coal).. . . . .	231	25,162 18	
Royalty.. . . . .	156	18,892 34	
Petroleum and natural gas.. . . . .	102	13,823 39	
Domestic coal permits.. . . . .	30	181 05	
Potash fees and rental.. . . . .	16	2,090 00	
Total.. . . . .			60,233 96
School Lands Branch—			
General sales.. . . . .	19	\$ 8,096 08	
Timber permits.. . . . .	7	42 50	
Hay payments.. . . . .	823	2,123 00	
Grazing rentals.. . . . .	854	13,116 97	
Coal rentals and fees.. . . . .	12	667 00	
"    royalty.. . . . .	8	652 50	
Petroleum and natural gas payments.. .	21	1,625 00	
Gravel dues.. . . . .	1	5 25	
Potash fees and rental.. . . . .	1	45 00	
Total.. . . . .			26,373 30
Grand total.. . . . .			\$591,226 65



10 GEORGE V, A. 1920

# REPORT OF THE AGENT OF DOMINION LANDS, E. W. WIDMEYER, DAUPHIN, MANITOBA.

Statement of business transacted during the fiscal year ending March 31, 1919:—

Land Patents Branch—	Number.	Revenue.	Total.
Homestead fees.. . . . .	424	\$4,220 00	
Improvements.. . . . .	30	1,038 90	
Land sales.. . . . .	35	2,046 58	
Searches.. . . . .	596	149 00	
Applications for patent.. . . . .	332	.....	
"    "    inspection.. . . . .	217	.....	
Entries cancelled.. . . . .	217	.....	
Sundries.. . . . .	2	12 50	
Total.. . . . .			\$ 7,466 98
Timber and Grazing Branch—			
Timber permits.. . . . .	542	\$2,421 00	
"    seizures.. . . . .	39	790 30	
Hay permits.. . . . .	405	1,237 00	
Grazing rentals.. . . . .	38	340 30	
Total.. . . . .			4,788 60
Forestry Branch—			
Timber permits.. . . . .	1,884	\$15,615 91	
Permit fees and rentals.. . . . .	33	225 00	
Seizures.. . . . .	75	983 44	
Grazing rentals.. . . . .	59	974 55	
Hay dues.. . . . .	355	947 40	
Total.. . . . .			18,746 30
School Lands Branch—			
General sales.. . . . .	8	\$1,621 79	
Timber permits.. . . . .	16	138 25	
Hay permits.. . . . .	260	539 35	
Grazing rentals.. . . . .	51	751 75	
Cultivation permits.. . . . .	2	53 90	
Total.. . . . .			3,105 04
Seed Grain Branch—			
Seed grain payments.. . . . .	19	\$737 88	
Total.. . . . .			737 88
Grand total.. . . . .			<u>\$34,844 80</u>



Land Patents Branch—	Number.	Revenue.	Total.
Soldier grants.. . . . .	225	.....	
Homestead fees.. . . . .	844	\$8,420 00	
Improvements.. . . . .	273	9,659 99	
Land sales, cash.. . . . .	87	7,396 97	
Pre-emption payments.. . . . .	2	1,159 69	
Purchased homestead payments .. . . .	8	214 34	
Searches.. . . . .	68	34 50	
Applications for patent recommended.. .	1,684	.....	
"    "    inspection received.. .	1,020	.....	
Entries cancelled.. . . . .	926	.....	
Sundries.. . . . .	4	32 00	
Total.. . . . .			\$26,917 49
<b>Timber and Grazing Branch—</b>			
Bonus.. . . . .	3	\$ 3,225 65	
Ground rent.. . . . .	33	4,564 86	
Royalty on sales.. . . . .	34	10,331 22	
Timber permits.. . . . .	1,184	9,219 19	
"    seizures.. . . . .	122	4,110 26	
Hay permits.. . . . .	1,232	2,897 60	
Grazing rentals, cash.. . . . .	225	900 15	
Sundries.. . . . .	596	28,600 14	
Total.. . . . .			63,849 07
<b>Forestry Branch—</b>			
Timber dues.. . . . .	19	\$3,942 53	
Permit fees and rental.. . . . .	33	10 75	
Seizures, grazing.. . . . .	1	13 00	
Grazing rent, etc.. . . . .	29	597 80	
Hay dues, etc.. . . . .	43	258 20	
Total.. . . . .			4,822 28
<b>Mining Lands and Yukon Branch—</b>			
Mining fees.. . . . .	88	\$ 354 50	
Rental.. . . . .	149	24,827 79	
Royalty.. . . . .	25	12,391 77	
Assessment payments.. . . . .	9	900 00	
Coal permits.. . . . .	1	.....	
Sundries.. . . . .	108	9,328 39	
Total.. . . . .			47,802 45
<b>School Lands Branch—</b>			
General sales.. . . . .	2	\$ 276 20	
Timber permits.. . . . .	35	807 15	
Hay permits.. . . . .	656	1,660 60	
Grazing rentals.. . . . .	325	5,425 48	
Coal rental.. . . . .	16	909 18	
Cultivation permits.. . . . .	1	15 00	
Sundries.. . . . .	75	2,535 89	
Total.. . . . .			11,629 50
<b>Miscellaneous—</b>			
Seed grain and provision payments.. . .	364	15,233 36	
Total.. . . . .			15,233 36
Grand total.. . . . .			\$170,254 15







SESSIONAL PAPER No. 25

# REPORT OF THE AGENT OF DOMINION LANDS, W. C. COWELL, KAMLOOPS, B.C.

Statement of business transacted during the fiscal year ending March 31, 1919:—

Land Patents Branch—	Number.	Revenue.	Total.
Homesteads.. . . . .	31	\$ 310 00	
Soldier grants.. . . . .	18	.....	
Improvements.. . . . .	36	3,516 48	
Land sales.. . . . .	26	3,154 88	
Ground rent.. . . . .	3	26 64	
Searches, etc.. . . . .	123	40 97	
Applications for patent.. . . . .	118	.....	
"    "    inspection.. . . . .	41	.....	
Homestead entries cancelled.. . . . .	28	.....	
Total.. . . . .			\$ 7,048 97
Timber and Grazing Lands Branch—			
Sale scale books.. . . . .	11	\$ 43 50	
Bonus.. . . . .	1	1,548 00	
Ground rent.. . . . .	54	4,540 04	
Royalty.. . . . .	33	12,874 45	
Timber permits.. . . . .	307	3,248 55	
"    seizures.. . . . .	3	31 30	
Hay permits.. . . . .	11	12 55	
Grazing rentals.. . . . .	498	8,063 74	
Improvements.. . . . .	1	50 00	
Registration fees.. . . . .	25	50 00	
Fire guarding.. . . . .	2	701 93	
Total.. . . . .			31,564 06
Forestry Branch—			
Timber dues.. . . . .	21	\$271 00	
Permit fees.. . . . .	29	7 25	
Seizures.. . . . .	2	79 93	
Rentals.. . . . .	8	89 40	
Hay dues.. . . . .	25	27 45	
Total.. . . . .			475 03
Mining Lands and Yukon Branch—			
Mining fees.. . . . .	13	\$160 00	
Rental.. . . . .	8	230 10	
Total.. . . . .			390 10
Miscellaneous—			
Seed grain collections.. . . . .	26	\$417 13	
Total.. . . . .			417 13
Grand total.. . . . .			\$39,895 29



REPORT OF THE ACTING AGENT OF DOMINION LANDS, J. A. REID,  
LETHBRIDGE, ALTA.

Statement of business transacted during the fiscal year ending March 31, 1919:—

Land Patents Branch—	Number.	Revenue.	Total.
Soldier grants.. . . . .	96	.....	
Homestead fees.. . . . .	161	\$ 1,610 00	
Pre-emption fees .. . . . .	4	40 00	
Purchased homestead fees.. . . . .	....	.....	
Improvements.. . . . .	49	2,850 18	
Land sales, cash.. . . . .	19	1,907 43	
Pre-emption payments.. . . . .	511	164,642 92	
Purchased homestead payments.. . . . .	79	12,510 87	
Searches, office fees, etc.. . . . .	124	37 55	
Applications for patent received.. . . . .	1,547	.....	
“ “ inspection received.. . . . .	134	.....	
Entries cancelled.. . . . .	190	.....	
Sundries.... . . . .	1	20 00	
Total.. . . . .			\$183,618 95
Timber and Grazing Branch—			
Timber permits.. . . . .	25	\$ 53 25	
Hay permits.. . . . .	104	131 85	
Grazing rentals.. . . . .	1,003	23,938 08	
Improvements.. . . . .	2	20 00	
Sundries.. . . . .	17	38 00	
Total.. . . . .			24,181 18
Forestry Branch—			
Timber dues.. . . . .	56	\$ 736 82	
Permit fees and rental.. . . . .	441	816 10	
Seizures.. . . . .	13	176 62	
Grazing rent, etc.. . . . .	252	5,535 03	
Hay dues, etc.. . . . .	161	486 95	
Total.. . . . .			7,751 52
Irrigation Branch—			
Irrigation sales.. . . . .	12	\$2,293 37	
Total.. . . . .			2,293 37
Mining Lands and Yukon Branch—			
Mining fees .. . . . .	22	\$ 297 50	
Rental.. . . . .	42	4,062 51	
Royalty.. . . . .	91	4,818 43	
Petroleum and natural gas.. . . . .	37	4,422 65	
Registration fees.. . . . .	2	4 00	
Total.. . . . .			13,605 09
School Lands Branch—			
General sales. . . . .	23	\$15,960 30	
Hay permits.. . . . .	128	129 30	
Grazing rentals.. . . . .	355	6,089 06	
Mining fees.. . . . .	2	10 00	
Coal, petroleum and gas rental .. . . . .	19	1,948 50	
Coal royalty.. . . . .	10	84 95	
Registration fees.. . . . .	2	4 50	
Total.. . . . .			24,226 61
Miscellaneous—			
Seed grain and provision payments.. . . . .	1,090	\$117,146 56	
Total.. . . . .			117,146 56
Grand total.. . . . .			\$372,823 28



SESSIONAL PAPER No. 25

# REPORT OF THE AGENT OF DOMINION LANDS, L. P. NOEL, MOOSEJAW, SASKATCHEWAN.

Statement of business transacted during the fiscal year ending March 31, 1919:—

Land Patents Branch—	Number.	Revenue.	Total.
Homestead fees.. . . . .	206	\$ 2,060 00	
Purchased homestead fees.. . . . .	2	20 00	
Improvements.. . . . .	37	2,984 35	
Land sales, cash.. . . . .	26	3,088 96	
Pre-emption payments.. . . . .	1,185	395,012 33	
Purchased homestead payments.. . . . .	132	22,114 86	
Searches.. . . . .	1,240	332 75	
Applications for patent received.. . . . .	3,060	.....	
"    "    Inspection received.. . . . .	190	.....	
Entries cancelled.. . . . .	377	.....	
Total.. . . . .			\$425,613 25
Timber and Grazing Branch—			
Bonus.. . . . .	1	\$ 2 00	
Timber seizures.. . . . .	1	25	
Hay permits.. . . . .	323	965 65	
Grazing rentals, cash.. . . . .	399	6,670 09	
Total.. . . . .			7,637 99
Forestry Branch—			
Timber dues.. . . . .	72	\$232 85	
Permit fees and rentals.. . . . .	28	116 25	
Seizures.. . . . .	10	55 25	
Grazing rent, etc.. . . . .	123	971 55	
Hay dues, etc.. . . . .	151	640 55	
Total.. . . . .			2,016 45
Mining Lands and Yukon Branch—			
Mining fees.. . . . .	44	\$ 249 25	
Rental.. . . . .	36	2,263 10	
Royalty.. . . . .	75	2,992 35	
Sundries.. . . . .	1	10	
Total.. . . . .			5,504 80
School Lands Branch—			
General sales.. . . . .	25	\$13,737 61	
Timber permits.. . . . .	1	75	
Hay permits.. . . . .	963	1,634 85	
Grazing rentals.. . . . .	877	9,821 37	
Coal rentals.. . . . .	2	105 00	
Cultivation permits.. . . . .	1	40 00	
Total.. . . . .			25,339 58
Miscellaneous—			
Seed grain and provision repayments.. . . . .	1,171	\$194,727 76	
Sundries.. . . . .	.....	8 02	
Total.. . . . .			194,735 78
Grand total.. . . . .			\$660,847 85







## SESSIONAL PAPER No. 25

# REPORT OF THE AGENT OF DOMINION LANDS, R. M. TREEN, PRINCE ALBERT, SASK.

Statement of business transacted during the fiscal year ending March 31, 1919:—

Land Patents Branch—	Number.	Revenue.	Total.
Homestead fees.. . . . .	535	\$5,350 00	
Improvements.. . . . .	76	2,852 50	
Land sales, cash.. . . . .	53	3,942 57	
Pre-emption payments.. . . . .	3	374 93	
Purchased homestead payments.. . . . .	6	918 48	
Searches, map sales, office fees, etc.. . . . .	189	47 25	
Applications for patent received.. . . . .	791	.....	
“ “ inspection received.. . . . .	214	.....	
Entries cancelled.. . . . .	294	.....	
Total.. . . . .			\$13,485 73
Timber and Grazing Branch			
Ground rent.. . . . .	25	\$ 5,580 40	
Royalty on sales.. . . . .	49	55,134 18	
Timber permits.. . . . .	811	8,432 65	
“ seizures.. . . . .	34	2,765 21	
Hay permits.. . . . .	614	1,573 10	
Grazing rentals, cash.. . . . .	321	1,513 91	
Sundries.. . . . .	.....	21 06	
Total.. . . . .			75,020 51
Forestry Branch—			
Timber dues.. . . . .	562	\$9,437 23	
Seizures.. . . . .	5	402 10	
Grazing rent, etc.. . . . .	65	919 75	
Hay dues, etc.. . . . .	127	550 25	
Total.. . . . .			11,309 33
Mining Lands and Yukon Branch—			
Mining fees.. . . . .	194	\$1,266 00	
Total.. . . . .			1,266 00
School Lands Branch—			
General sales.. . . . .	2	\$ 40 00	
Timber permits.. . . . .	45	602 11	
Hay permits.. . . . .	334	647 65	
Grazing rentals.. . . . .	228	2,355 08	
Timber seizures.. . . . .	3	7 50	
Cultivation permits.. . . . .	3	28 50	
Total.. . . . .			3,680 84
Miscellaneous—			
Seed grain and provision repayments.. . . . .	133	\$5,912 44	
Total.. . . . .			5,912 44
Grand total.. . . . .			<u>\$110,674 85</u>







## SESSIONAL PAPER No. 25

## REPORT OF THE ACTING AGENT OF DOMINION LANDS, L. C. PATTERSON, SASKATOON, SASK.

Statement of business transacted during the fiscal year ending March 31, 1919:—

Land Patents Branch—	Number.	Revenue.	Total.
Homestead fees.. . . . .	123	\$ 1,230 00	
Pre-emption fees.. . . . .	1	10 00	
Improvements.. . . . .	35	2,222 05	
Land sales, cash.. . . . .	68	9,806 89	
Douk. Time sales.. . . . .	110	30,746 05	
Pre-emption payments.. . . . .	338	114,311 64	
Purchased homestead payments.. . . . .	189	32,745 49	
Searches, etc.. . . . .	568	142 00	
Applications for patent.. . . . .	1,468	.....	
"    "    inspection.. . . . .	92	.....	
Entries cancelled.. . . . .	140	.....	
Sundries, seed grain statements.. . . . .	29	912 00	
Total.. . . . .			\$192,126 12
Timber and Grazing Branch—			
Timber permits.. . . . .	97	\$ 137 30	
"    seizures.. . . . .	4	75 00	
Hay permits.. . . . .	460	1,137 92	
Grazing rentals.. . . . .	39	398 66	
Sundries.. . . . .	1	3 25	
Total.. . . . .			1,752 13
Forestry Branch—			
Timber dues, excess.. . . . .	193	\$353 97	
Permit fees and rentals.. . . . .	154	601 06	
Seizures.. . . . .	11	145 50	
Grazing rent, etc.. . . . .	85	903 75	
Hay dues, etc.. . . . .	156	748 75	
Total.. . . . .			2,753 03
Mining Lands and Yukon Branch—			
Mining fees.. . . . .	160	\$1,659 65	
Sundries, quarrying leases.. . . . .	11	197 00	
Total.. . . . .			1,856 65
School Lands Branch—			
General sales.. . . . .	14	\$18,569 36	
Timber permits.. . . . .	4	11 50	
Hay permits, excess.. . . . .	693	1,925 52	
Grazing rentals.. . . . .	1,346	5,048 05	
Mining fees.. . . . .	2	40 00	
Cultivation permits.. . . . .	1	12 50	
Registration fees (sundries).. . . . .	3	16 50	
Total.. . . . .			25,623 43
Miscellaneous—			
Seed grain and provisions.. . . . .	1,386	\$167,406 01	
Sundries, seed grain.. . . . .	1	230 80	
Total.. . . . .			167,636 81
Grand total.. . . . .			\$391,748 17







SESSIONAL PAPER No. 25

# REPORT OF THE AGENT OF DOMINION LANDS, L. RANKIN, WINNIPEG, MAN.

Statement of business transacted during the fiscal year ending March 31, 1919:—

Land Patents Branch—	Number.	Revenue.	Total.
Homestead entries.. . . . .	389	\$ 3,890 00	
Improvements.. . . . .	138	6,087 19	
Land sales, cash.. . . . .	65	5,975 25	
Searches, maps, etc.. . . . .	710	399 75	/
Seed grain.. . . . .	402	12,062 86	
Sundries.. . . . .	2	123 64	
Total.. . . . .			\$28,538 69
Timber and Grazing Lands Branch—			
Hay rental.. . . . .	1	\$ 9 95	
Grazing rental.. . . . .	95	710 17	
Total.. . . . .			720 12
Mines Branch—			
Mining fees.. . . . .	1,401	\$6,222 00	
Quarries.. . . . .	19	511 81	
Rentals.. . . . .	22	510 93	
Petroleum gas.. . . . .	3	350 00	
Total.. . . . .			7,594 74
School Lands Branch—			
Sales.. . . . .	31	\$9,362 64	
Grazing rentals.. . . . .	175	2,307 80	
Coal permits.. . . . .	2	10 00	
Total.. . . . .			11,680 44
Grand total.. . . . .			\$48,533 99

## REPORT OF THE MINING LANDS AND YUKON BRANCH.

H. H. ROWATT.

The total revenue of this branch, derived from all sources during the fiscal year, amounts to \$625,547.88. Owing to conditions resulting from the war it has been found necessary to grant, in a number of cases, extensions of time within which to pay the rental of mining locations acquired under lease.

The statements lettered "A" and "B," showing in different forms how the revenue is made up, will be found at the end of this report. The statement lettered "A" shows the total revenue, and the statement lettered "B" shows the revenue collected at each agency, including the Yukon Territory.

The revenue for the Yukon Territory for the year amounts to \$112,493.85.

The reports and statements for the fiscal year from the Gold Commissioner and the Crown Timber and Land Agent at Dawson in the Yukon Territory, also the report of the Inspecting Engineer, are herewith submitted.

### TIMBER IN THE YUKON TERRITORY.

The total amount of dues collected on account of timber in the Yukon Territory during the fiscal year was \$7,936.23. During the year 81 permits were issued, under the authority of which 2,785 feet b.m. of timber and 8,972½ cords of wood were cut. The dues collected on permits issued amounted to \$5,072.28.



10 GEORGE V, A. 1920

There are in existence 88 timber berths held under license to cut timber within the Territory, covering an area of 182.93 square miles, which licenses were granted prior to the 10th May, 1906, on which date the regulations governing the granting of licenses to cut such timber in the Territory were rescinded, and regulations for the issue of permits to cut timber substituted therefor.

According to returns received in the department, the number of feet b.m. of lumber manufactured under license during the year and sold was 125,000 and the number of cords of wood cut 3,038½. Seizure dues, amounting to \$1,616.45, were collected on 795½ cords of wood and 265,239 feet of lumber cut in trespass. This does not include the very large amount of timber and cordwood cut free of dues for mining purposes.

#### MINING LANDS OTHER THAN COAL.

During the fiscal year 1,114 entries for quartz mining claims were granted by the mining recorders in Manitoba, Saskatchewan and Alberta, and by the mining recorder for unorganized districts.

According to the returns received from the Yukon Territory during the fiscal year, 317 entries for placer mining claims, 101 entries for quartz mining claims, and 2,317 renewals and relocations were recorded. The revenue collected from these sources and from fees for registering documents in connection with mining properties was \$54,674.90.

#### ROYALTY AND GOLD MINED IN THE YUKON TERRITORY.

The total amount collected up to the 31st of March, 1919, for royalty on gold, the output of placer mining claims in the Yukon Territory, after deducting the exemption at one time allowed under the regulations, was \$4,713,297.71 of which amount \$48,677.07 was collected during the last fiscal year. For the purpose of estimating this royalty the gold is valued at \$15 an ounce, which is much below its real value.

The actual value of gold produced from placer mining operations in the Yukon Territory, up to the 31st of March last, might be safely placed at \$154,910,300.

The statement lettered "C," at the end of this report shows the total gold production, the total production subject to royalty, and the total royalty collected for each fiscal year from the 1st May, 1898, to the 31st March, 1919.

#### DREDGING.

Twenty-five leases to dredge for minerals in the beds of rivers in the Yukon Territory are now in force, covering a total frontage of 147.76 miles. The total revenue derived from this source up to the 31st of March, 1919, amounts to \$199,956.08, of which amount \$1,695.10 was collected during the fiscal year just closed.

These dredging leases are confined to the Yukon, Fortymile, and Klondike rivers.

There are in operation in the Yukon Territory 8 dredges. Most of these dredges are working on the Klondike river and tributaries, and are operated by hydro-electric motive power. Two of the largest gold-saving dredges in the world are being operated most successfully on the Klondike river-flat.

Eight leases to dredge for minerals in the submerged beds of rivers in the provinces of Alberta and Saskatchewan are now in force, covering a total frontage of 38.19 miles. Of these leases 7 are in the province of Alberta and include 31 miles, and one is in the province of Saskatchewan and includes 7.19 miles. The total revenue derived from this source up to the 31st March, 1919, amounts to \$46,636.35, of which amount \$110 was collected during the past fiscal year.



## SESSIONAL PAPER No. 25

## HYDRAULIC MINING.

The hydraulic mining regulations relating to the Yukon Territory were rescinded by an Order in Council dated the 2nd of February, 1904, but leases already granted were not affected by such withdrawal.

There are still in force in the Yukon Territory 7 hydraulic mining leases, covering an area of 15.27 square miles. Since the Hydraulic Mining Regulations were first established in December, 1898, 47 hydraulic mining leases have been issued, all of which have now been cancelled, with the exception of the above number.

## HOMESTEADS IN THE YUKON TERRITORY.

Ninety-seven homestead entries in the Yukon Territory have been granted, of which 62 are now in force, comprising a total area of 9,610.56 acres. Patents have been issued for 14 homesteads.

## PETROLEUM AND NATURAL GAS

There are now in force under the regulations 3,172 petroleum and natural gas leases, embracing a total area of 1,109,934 acres, distributed as follows: In Manitoba 4 leases, comprising 1,053 acres; in Saskatchewan 91 leases, comprising 41,888 acres; in Alberta 2,816 leases, comprising 973,621 acres; in British Columbia 253 leases, comprising 84,412 acres; and in the Northwest Territories 8 leases, comprising 8,960 acres. The total revenue derived from petroleum lands during the year amounts to \$106,116.66.

Natural gas has been discovered and is now being utilized for commercial and domestic purposes in different parts of the province of Alberta. Oil has been discovered, but not in large quantities. Boring operations are being carried on throughout Alberta and Saskatchewan with a view to further discoveries.

## QUARRYING.

The number of leases now in force, issued under the provisions of the regulations, is 282, distributed as follows: In Manitoba 82 leases, comprising 2,439 acres; in Saskatchewan 46 leases, comprising 1,452 acres; in Alberta 87 leases, comprising 3,662 acres; and in British Columbia 67 leases, comprising 2,101 acres.

The total revenue collected during the fiscal year on account of quarrying leases, including the application fees, amounts to \$8,052.84.

## WATER-RIGHTS.

There are now in force in the Yukon Territory 475 grants to divert water for mining purposes, aggregating a total of 117,471 miner's inches. During the last fiscal year 7 water-rights were issued, comprising 1,900 miner's inches.

Grants are issued by this department authorizing the diversion of water in the Yukon Territory for power purposes. Up to date 13 grants have been issued, authorizing the diversion of 131,200 miner's inches of water, 4 of these grants have been permitted to lapse, but the remaining 9 authorizing the diversion of 66,200 miner's inches of water, are in good standing. Two power plants have been installed, one of which is situated on the north fork of the Klondike river, and it appears that this plant is kept in operation during the winter, and the power generated is being used for heating and lighting purposes in the city of Dawson.



10 GEORGE V, A. 1920

COAL MINING LANDS.

The regulations authorizing the sale of coal mining lands have been rescinded and all sales made previous to the withdrawal of the regulations have been completed. The total amount of revenue received on this account was \$2,097,228.90.

COAL LEASES.

The total number of coal mining leases in force at the close of the fiscal year was 558 including a total of 251,028 acres, distributed as follows: In the province of Alberta 477 leases, comprising 241,368 acres, in Saskatchewan 79 leases, comprising 7,460 acres; in British Columbia 1 lease, comprising 2,160 acres and in the Yukon Territory 1 lease, comprising 40 acres.

The total number of leases of coal mining rights issued during the year was 121 comprising 52,612 acres. The total revenue received during the year for rental of coal mining rights was \$194,000.38.

ROYALTY ON COAL.

Under the regulations governing the issue of leases to mine coal the royalty is fixed at five cents per ton of 2,000 pounds on the merchantable output of the mine.

The following is a statement showing the amount collected on account of royalty on coal mined from lands in the Western Provinces, the North West Territories, and the Yukon Territory, respectively, during each year since the regulations came into effect:—

Year.	Alberta.	Saskatchewan.	British Columbia.	Yukon.	N. W. T.
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
1903-4	56 90	Nil	Nil	2 40	Nil
1904-5	2,822 00	110 70	"	47 00	"
1905-6	2,379 75	47 10	"	569 33	"
1906-7	3,865 26	74 20	"	517 34	"
1907-8	7,621 67	4 30	"	1,543 38	"
1908-9	5,322 39	358 11	"	371 73	"
1909-10	153,559 98	1,672 50	3 00	136 38	"
1910-11	218,932 88	2,184 74	3 50	125 00	"
1911-12	104,894 55	2,034 74	2 78	390 00	"
1912-13	142,997 79	3,145 72	6 95	1,069 11	"
1913-14	147,198 75	2,123 43	19 35	Nil	"
1914-15	104,489 77	1,880 06	4 90	"	"
1915-16	67,190 17	2,601 52	3 50	"	5 10
1916-17	149,447 82	2,228 08	8 92	"	Nil
1917-18	144,634 75	4,046 55	Nil	"	6 00
1918-19	175,687 66	3,193 05	Nil	"	Nil

By an Order in Council dated the 16th of March, 1918, provision was made that, owing to the scarcity of fuel in the Yukon Territory, no royalty shall be levied or collected on coal mined in that Territory for a period of five years, that is, up to the 7th of April, 1923.

The total amount derived from coal mining lands on account of purchase price, rental royalty and application fees, during the fiscal year, amounted to \$375,437.94.

During the past year gold to the value of \$139,638 was extracted from ores taken from mineral claims in Northern Manitoba, and over two million pounds of copper obtained from ore mined in the same district.

There were thirteen members of the staff of this Branch on active service.



## SESSIONAL PAPER No. 25

## REVENUE OF DOMINION LANDS INCLUDING THE YUKON TERRITORY.

A.—STATEMENT of receipts on account of coal and minerals in the Provinces and Territories, also Timber, Hay, Coal, Hydraulic Mining, Dredging, Royalty on Gold, Mining Fees, Rental of Agricultural Lands, Water-Power and Water Fronts and sale of Dominion Lands in the Yukon Territory. For the fiscal year ended 31st March, 1919:—

Quartz acreage sales.. . . .	\$ 253 68	Free certificates, export of gold \$	10 50
Dominion lands sales.. . . .	339 78	Stone quarry.. . . .	8,052 84
Coal mining.. . . .	2,556 85	Registration fees.. . . .	61 50
Coal royalty.. . . .	178,880 71	Homestead fees.. . . .	30 00
Coal rental.. . . .	194,600 38	Hay, Yukon.. . . .	30 55
Rental, Yukon.. . . .	11,608 07	Interim receipt account .. . . .	1,192 75
Timber dues, Yukon .. . . .	7,936 23	Tar sands.. . . .	1,021 94
Mining fees.. . . .	54,674 90	Sand, stone and gravel.. . . .	2 56
Hydraulic leases .. . . .	4,393 72	Petroleum .. . . .	106,116 66
Dredging leases, N.W.T.. . . .	110 00	Potash.. . . .	3,902 15
Dredging leases, Yukon.. . . .	1,695 10		
Gold export tax.. . . .	48,677 07	Total.. . . .	\$625,547 88

B.—STATEMENT showing the total amount of revenue collected at each agency, including the Yukon Territory, for the fiscal year ended 31st March, 1919.

Battleford.. . . .	\$ 146 36	Duncan, Mining Recorder's Office	353 18
Calgary.. . . .	172,864 73	Sixtymile, Min. Recorder's Office.	50 00
Edmonton.. . . .	128,273 26	Dawson, Crown Timber Office.	6,421 13
Grade Prairie.. . . .	190 15	Dawson, Royalty Collector's Office.. . . .	48,464 63
Kamloops.. . . .	695 84	Dawson, Comptroller's Office..	8 50
Lethbridge.. . . .	115,557 98	Dawson Dom. Lands Office.. . .	9,066 60
Moosejaw.. . . .	8,009 27	Dawson, Min. Recorder's Office..	210 00
New Westminster.. . . .	17,227 63	Whitehorse, Min. Rec. Office..	795 50
The Pas.. . . .	4,957 55	Whitehorse Crown Tim. Office..	1,545 65
Peace River.. . . .	45,565 33	Whitehorse Royalty Collector's Office.. . . .	212 44
Prince Albert.. . . .	2,181 00	Whitehorse Agent to Comptroller	2 00
Revelstoke.. . . .	84 64	Whitehorse Dom. Lands Office..	2,963 75
Saskatoon.. . . .	2,374 66		
Swift Current.. . . .	6,138 75	Total.. . . .	\$625,547 88
Unorganized.. . . .	114 00		
Winnipeg.. . . .	8,672 88		
Dawson, Gold Comm'r Office..	42,400 47		

C.—STATEMENT showing the total Gold Production, the total subject to Royalty and the total Royalty collected for each fiscal year from May 1, 1897, to March 31, 1919.

Fiscal Year.	Gold Production.	Subject to Royalty.	Royalty Collected.	Total Revenue.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.
1897-1898.....	3,072,773 20	2,732,928 20	273,292 82	273,292 82
1898-1899.....	7,582,283 02	5,882,626 00	588,262 37	588,943 52
1899-1900.....	9,809,464 64	7,307,720 00	730,771 99	733,041 04
1900-1901.....	9,162,082 79	7,234,416 17	592,660 98	596,368 03
1901-1902.....	9,566,340 52	8,367,225 88	331,436 79	331,532 04
1902-1903.....	12,113,015 34	12,113,015 34	302,893 48	302,893 48
1903-1904.....	10,790,663 12	10,790,663 12	272,217 96	272,217 96
1904-1905.....	8,222,053 91	8,222,053 91	206,760 87	206,760 87
1905-1906.....	6,540,007 09	6,540,007 09	163,963 25	163,963 25
1906-1907.....	3,304,791 05	3,304,791 05	82,622 42	82,622 42
1907-1908.....	2,820,161 60	2,820,161 60	70,504 65	70,504 65
1908-1909.....	3,260,282 80	3,260,282 80	81,507 07	81,507 07
1909-1910.....	3,594,251 20	3,594,251 20	89,844 10	89,844 10
1910-1911.....	4,126,727 60	4,126,727 60	103,168 19	103,168 19
1911-1912.....	4,024,236 75	4,024,236 75	100,606 29	100,606 29
1912-1913.....	5,018,411 85	5,018,411 85	125,460 52	125,460 52
1913-1914.....	5,301,507 60	5,301,507 60	132,537 69	132,537 69
1914-1915.....	4,649,634 40	4,649,634 40	116,241 04	116,241 04
1915-1916.....	4,458,278 00	4,458,278 00	111,457 19	111,457 19
1916-1917.....	3,960,206 99	3,960,206 99	99,007 92	99,007 92
1917-1918.....	3,266,018 85	3,266,018 85	81,650 55	81,650 55
1918-1919.....	1,947,082 20	1,947,082 20	48,677 07	48,677 07
Total .. . . .	126,590,274 52	118,922,246 60	4,705,545 21	4,713,297 71



10 GEORGE V, A. 1920

## GOLD COMMISSIONER'S REPORT.—G. P. MacKENZIE.

There has been a decrease of revenue compared with the previous year, the chief decrease being on account of renewal fees. This loss of revenue is directly the result of the war conditions, a large number of claims being held free from cancellation, without the necessity of renewal, owing to the fact that their owners are on Military Service.

## GOLD PLACER MINING.

129,805.48 ozs. of gold were mined during the year and royalty amounting to \$48,677.07 paid.

The production was greatly affected by war conditions. Each successive year since 1914 has seen a tremendous increase in the price of all kinds of provisions and particularly in dredge machinery and repair parts, and as there has been no increase in the value of the gold mined, it is nothing short of remarkable that the industry has been able to stand the strain and that the production is not entirely ceased. Large areas of known pay gravels are not being worked at the present time, owing to the almost prohibitive cost of installing the necessary machinery.

## YUKON GOLD COMPANY.

*Dredging Operations.*—The Yukon Gold Company operated five dredges continuously for a period of 139 days from May 25 to October 11.

These dredges are electrically driven and are operated by power furnished by the company's hydro-electric plant on the Twelve-Mile river. A total of 2,767,000 cubic yards of material was dredged.

*Hydraulic Operations:* Hydraulic operations were carried on at eight different points on the company's property as follows: Adams Hill, Bunker Hill, Monte Cristo Gulch, American Gulch, Cheechace Hill, Oro Fino Gulch, Fox Gulch, Trail Gulch. A total of 2,054,000 cubic yards of material was washed.

## CANADIAN KLONDIKE MINING COMPANY, LIMITED.

*Dredging Operations:* The Canadian Klondyke Mining Company, Limited, operated three dredges:—

Canadian No. 1 operated 123 days from June 4 to October 5 and during that period dredged 553,500 cubic yards of gravels.

Canadian No. 2 operated 195 days from May 9 to November 20 and during that period dredged 1,919,670 cubic yards of material.

Canadian No. 4 operated 338 days from May 1, 1918, to April 3, 1919, and dredged 300,000,000 cubic yards of gravels.

It is worthy of note that Canadian No. 4 made a record for continuous operations in the Yukon and that it operated successfully throughout the entire winter and was only closed down on April 3 to enable the necessary repairs to be made.



## SESSIONAL PAPER No. 25

These dredges are all electrically driven, power being furnished by the Canadian Klondyke Power Company's hydro-electric plant at the North Fork of the Klondyke river. This plant was in operation continuously throughout the entire year and is capable of developing all the power required in the district.

*Hydraulic Operations:* The company operated their pumping plant at the mouth of Hunker creek, where the water is pumped from the Klondyke river to a ditch on the Left limit of Hunker creek and from thence conveyed to property owned by the company at Last Chance creek, and is also sold to individual operators. The water is pumped by means of power furnished by the North Fork plant. It is worthy of note that the Canadian Klondyke Power Company was able to again successfully operate their hydro-electric plant throughout the entire winter. The water to furnish the power is conveyed through six miles of ditch or canal. The practice is to fill the ditch when the ice is forming in the fall and when frozen over to drop the water a few inches, the ice then acts as a protection and prevents the water from freezing in the ditch.

In addition to the operations referred to this company operates a large machine shop for the necessary repairs of the equipment.

## NORTH WEST CORPORATION, LIMITED.

This company has not yet installed machinery on their large holdings, but continue their ground sluicing operations, removing the overburden from the gravels preparatory to actual mining operations. 284,242 cubic yards of material was removed by ground sluicing on placer claims between Nos. 236 and 276 below Lower Discovery Dominion and 165,200 cubic yards from placer claims on Lower Quartz creek.

In addition to this ground sluicing, 53 prospecting shafts, averaging a depth of forty feet were sunk on claims on Lower Dominion and 35 shafts, averaging 20 feet in depth on Lower Quartz. It is confidently hoped that as soon as conditions approach normal, this company will equip their holdings with requisite machinery.

## OTHER PLACER OPERATIONS.

Hydraulic operations by eight operators were carried on on Hunker creek and tributaries, Last Chance creek, Hunker hills immediately below Independence creek, Temperance hill, Paradise hill and on Whiskey hill.

A number of open cut operations were carried on on Upper Hunker and Gold Bottom creeks during the summer months and drifting operations during the winter months.

There were ten outfits on the Ten Mile, fifteen on Kirkman, five on Thistle, six on Black Hills and eight on Scroggie creek. Henderson and Nansen creeks were also mined on a small scale. On Sulphur creek ten individual outfits were operating. Quartz creek was the busiest creek in the district and continues to be a steady producer.

On Dominion creek the only individual operations were on the upper end of the creek. In the Upper Stewart country, Hight continues to be the banner creek.

## LODE MINING.

Of the large number of mineral claims in good standing, many of them crown granted, on only a few has development work of any consequence been attempted during the year.



10 GEORGE V, A. 1920

Extensive development work has been carried on on the Big Horn creek, a tributary of the Upper McQuestion river in silver-lead. A number of other silver-lead properties in the same mineral belt are now being prospected and the outlook for this class of mining is most encouraging. A group of silver-lead properties on the Little Twelve Mile have been opened up during the past year and high grade galena ore discovered. The outlook is most hopeful with regard to these properties.

On William creek development work on copper properties is reported as encouraging. In a general way the outlook for rock mining in the northern end of the Territory was never more promising.

#### SCHEELITE.

Reference was made in my report of last year to deposits of scheelite on Dublin gulch. Further investigation has shown that placer scheelite can be profitably saved in connection with placer gold mining operations on that stream.

### REPORT OF CROWN TIMBER AND LAND AGENT, DAWSON, YUKON TERRITORY.—G. P. MacKENZIE.

There has been a net decrease in revenue compared with the previous year of \$539.34 in the Land Branch and \$5,183.13 in the Timber Branch.

The considerable decrease in revenue in the Timber Branch is accounted for by the fact that less wood was used for domestic purposes in Dawson and on the river steamers plying the Upper Yukon.

#### WOOD AND TIMBER.

Seventy-seven permits were issued during the year under authority of which 6,855½ cords of wood were cut. Seizure dues were paid on 265,239 feet b.m. logs and on 795½ cords of wood. 1,903 cords of wood and 10,000 feet b.m. logs were cut under license. As in former years large quantities of wood were used for mining purposes for which no dues are collectable.

The demand for manufactured lumber during the year was very light and as a consequence not much new lumber was manufactured, but the Yukon Saw Mill Company, Dawson, operated their mill during part of the season and have in their yards a well assorted stock of native and imported lumber.

The ordinance for prevention of fires was rigidly enforced and I am pleased to report that no forest fires of any magnitude occurred during the year.

#### COAL.

The Five Fingers Coal Company operated their mine at Tantalus and shipped to Dawson sufficient coal to meet all requirements.



## SESSIONAL PAPER No. 25

## REPORT OF INSPECTING ENGINEER M. L. &amp; Y. BRANCH—O. S. FINNIE.

During the summer of 1918, considerable anxiety was felt over a possible shortage of coal throughout the Dominion. The quantity allowed to come in through the United States was limited, and, because Alberta had large coal deposits of her own, Eastern coal was not placed on the market west of Winnipeg. This, together with the further reason that the Fuel Controller had strongly advised the people of Canada to obtain their coal supply in advance, had the effect of speeding up the output of the Western mines. The result was that more coal was mined in the provinces of Saskatchewan and Alberta during the summer and fall of 1918 than during the same interval in any previous year, and, for the first time on record, the output from Alberta for 1918 exceeded that from Nova Scotia.

The schedule hereunder gives the output subject to royalty, the output not subject to royalty and the total output for the calendar year, 1918:—

PROVINCE.	Output Subject to Royalty year ending December 31, 1918.		Output not Subject to Royalty.	Total Output For 1918.
	From Dominion Lands.	From School Lands.		
Saskatchewan. ....	60299	6043	281280	347622
Alberta ..	2984882	383465	2702262	6070609
	3045181	389508	2983542	6418231

The Federal Government does not exact a royalty on unmerchantable slack, or coal consumed under boilers at mines, or coal taken from road allowances. Neither is it exacted on mines located on Hudson's Bay Lands, or lands given as subsidies to railways, or lands disposed of prior to the introduction of royalty. Because of these exemptions, it will be observed that the quantity on which royalty is not paid is almost as great as that on which it is.

The schedule hereunder shows the total number of coal mines operating in the two provinces named, also the number which are subject to royalty and those which are not:—

PROVINCE.	Number of operating coal mines.			
	Subject to Royalty.		Not Subject to Royalty.	Total.
	On Dominion Lands.	On School Lands.		
Saskatchewan. ....	52	10	5	67
Alberta. ....	192	19	49	260
	244	29	54	327

Practically all coal mines subject to royalty were inspected during the past year. Those requiring it, were inspected twice.

A number of cases were found where mines were opened and operated outside the area held under lease, also cases of encroachment, and another case, in Saskatchewan, where an operator had run an entry for 160 feet almost immediately under and parallel to the main line of a railway. Such cases indicate the necessity of careful and systematic inspection and survey.

In November, 1918, one of the mine inspectors, was transferred permanently to Calgary. It was thought he would be of greater assistance to the Department by having



10 GEORGE V A. 1920

headquarters at Calgary, in the centre of the mining district, than by making periodical trips from Ottawa to the West.

The oil and gas districts were also inspected. They include the following fields: (1) Medicine Hat, (2) Bow Island, (3) Okotoks, (4) Viking, (5) Peace River, (6) Pelican.

(1) In the Medicine Hat field, 30 wells have been sunk, and at Redcliff 6 wells. The gas is used to a great extent for industrial purposes. The pressure, which was formerly about 500 pounds per square inch, has fallen off considerably in the past few years. One well in the district got beyond control. It was sunk by the Canada Cement Company and because of a broken casing considerable difficulty was experienced in controlling the flow of gas. Every effort is being made to correct this defect.

(2) In the Bow Island field 28 wells have been sunk. The company operating this field is known as The Canadian Western Natural Gas, Light, Heat and Power Company. It supplies gas for domestic and industrial purposes to the towns of Lethbridge, McLeod, Calgary, and other places along the route. The capacity of the Bow Island-Calgary pipe line is 39 million cubic feet daily. All the wells in this field are under control and no gas is escaping.

(3) In the Okotoks field, there is not only a large supply of gas, but, in addition, five wells are producing oil. The total amount of gasoline shipped from Okotoks station, up to the 30th July, 1918, was 634,756 gallons. There are also three distilling plants in the field, as well as a gasoline absorption plant. This gas contains about one-half gallon gasoline per one thousand feet of gas. Many thousands of gallons gasoline will be recovered by this plant.

(4) In the Viking district, the main operator is The Northern Alberta Natural Gas Development Company, Limited. This company has nine wells, situated 3 to 9 miles north of the town of Viking. These wells have a capacity of 1,700,000 feet to 5,000,000 feet per day. It is hoped that this field will furnish sufficient gas to supply the city of Edmonton.

(5) In the Peace River district, 9 wells have been sunk. Those wells reaching a depth of 860 feet have struck the heavy black oil. This oil does not flow freely, but requires to be pumped. The capacity of these wells has yet to be determined. A large flow of water was encountered under the oil horizon at a depth of about 1,130 feet. The Peace River Oil Company have not yet been able to control the flow of this water in Wells Nos. 1 and 2. They will make a further attempt during the summer of 1919, and have undertaken to stop the flow of gas now escaping and to shut off this water which may be gaining access to the oil-bearing formation.

(6) A special trip was made to investigate the old Pelican well on the Athabaska river, which has been blowing off since the well was sunk in 1897. A survey was made to determine its location, and measurements made to ascertain the amount of gas escaping. It was found that 850,000 feet were escaping daily. Arrangements have since been made to correct this unnecessary waste. A number of other wells were sunk in this district by the Pelican Oil and Gas Company. Little oil was found but all the holes showed a large pressure of gas. All these wells are securely shut off. In the time to come the gas of this field will be found very useful for industrial and domestic purposes. The distance is not too great to expect it to be piped as far south as the city of Edmonton.

In order that the Department may be kept well informed on the oil and gas operations of the West, and that the wells are sunk with a view to conservation, and the petroleum regulations strictly observed, the Department has decided to appoint a Petroleum Engineer, whose duty it will be to investigate and supervise such matters.

The following is a synopsis of the work carried on by this Division during the past year: Number of inspections and reports, about 300; plans received and examined, 205; new surveys, 13; extensions of former surveys, 21; plans compiled, 31; declarations taken, about 50; computations of coal output from surveys, 175; reports on oil and gas, 20.



## SESSIONAL PAPER No. 25

REPORT OF THE CONTROLLER, TIMBER AND GRAZING LANDS BRANCH.  
B. L. YORK.

The total revenue derived from timber, grazing and hay lands during the fiscal year amounts to \$516,938.53.

## TIMBER.

At the conclusion of this report will be found statements "A," "B" and "C," showing the total revenue; the revenue from timber by agencies and other sources of revenue by Agencies.

Statements from the Crown Timber Agents at Calgary, Edmonton, Prince Albert, Winnipeg, Kamloops, New Westminster and Revelstoke, showing the revenue collected on Dominion Lands within their respective agencies, and other information are appended hereto.

The report of the Inspector of Crown Timber Agencies, and the reports of the Inspectors of Ranches located at Calgary, Moosejaw, Prince Albert, are also attached.

The revenue derived from timber and grazing lands, received at the Crown Timber agencies, also the number of mills operated on berths held under license and the number of portable sawmills in operation, may be summarized as follows:—

Agency.	Total Revenue	No. of mills operating under licence.	No. of mills operating under permit.
	\$ cts.		
Calgary .....	31,704 41	15	15
Edmonton .....	64,679 76	28	79
Prince Albert .....	75,933 01	15	32
Winnipeg .....	62,835 34	23	38
Kamloops .....	32,251 88	6	
New Westminster .....	96,724 56	26	
Revelstoke .....	17,263 42	3	

The returns of operations received from the timber agencies show the quantity of timber manufactured and sold, under license, to be as follows:—

	Manufactured.	Sold.
Sawn lumber, feet b.m. ....	291,621,515	267,540,214
Railway ties .....	214,547	147,184
Laths .....	31,759,100	25,355,420
Shingle bolts .....	35,051	28,579
Shingles .....		22,060
Fence posts .....	767,508	
Telegraph poles .....	1,456	
Piling, lineal feet .....	52,088	26,173
Cribbing, lineal feet .....	20,341	
Cordwood .....	2,299	3,420



10 GEORGE V, A. 1920

The following shows the material manufactured on permit and portable sawmill berths and the quantity sold.

	Manufactured.	Sold.
Lumber, feet b. m.....	21,313,411	31,958,666
Railway ties.....	61,063	77,663
Fence posts.....	150,181	140,006
Laths.....	112,750	112,750
Telegraph poles.....	620	620
Shingle bolts.....	106	106
Cordwood.....	6,131	8,209
Mining props, feet b. m.....	2,323,637	1,637,416
Mining timber, lineal feet.....	45,000	69,030

The quantity of lumber manufactured and sold within each agency will be found in the Agent's report appended hereto.

The area of timber lands held under license and permit in the provinces of Manitoba, Saskatchewan, Alberta and British Columbia is as follows:—

	Under license. Square miles.	Under permit, Square miles.
Manitoba.....	1088·08	476·03
Saskatchewan.....	1835·53	111·60
Alberta.....	1956·46	84·43
British Columbia.....	1776·36	4·43
	6656·43	676·49

During the year ninety-six berths were granted of which five were license berths, fifty-three cordwood berths, thirty-two portable sawmills and six permit berths.

GRAZING.

There were in force on March 31, 1919, 5,346 grazing leases, covering an area of 6,168,295 acres as follows:—

	Acres.
Manitoba.....	83,033
Saskatchewan.....	2,824,654
Alberta.....	2,850,002
British Columbia.....	410,606

This is an increase of 422,117 acres over the previous year. During the year there were 886 new leases issued.

STATEMENT "A."—Statement of Revenue for Fiscal Year 1918-1919.

Timber.....	\$345,205 53
Grazing.....	124,409 77
Hay.....	17,347 49
Registration.....	190 00
Firetax.....	23,844 73
Improvements.....	610 00
Scaling fees.....	5,285 26
Scaling books.....	45 75
Total.....	\$516,938 53



## SESSIONAL PAPER No. 25

## STATEMENT "B."—Statement of Revenue from Timber for Fiscal Year 1918-1919.

Bonus under license.. . . .	\$ 17,316 47
Rental under license.. . . .	45,185 74
Royalty under license.. . . .	152,902 37
Permit fees, dues and rental.. . . .	112,360 82
Seizures.. . . .	16,840 15
Scaling fees.. . . .	5,285 26
Scaling books.. . . .	45 75
<b>Total.. . . .</b>	<b>\$350,536 54</b>

## STATEMENT "C."—Statement of Revenue from Grazing, Hay, Registration Fees, Fire-guarding Dues, and Improvements for Fiscal Year 1918-1919.

Grazing.. . . .	\$124,409 77
Hay.. . . .	17,347 49
Registration fees.. . . .	190 00
Firetax.. . . .	2,784 24
Firetax collected at Head Office.. . . .	21,060 49
Improvements.. . . .	610 00
<b>Total .. . . .</b>	<b>\$166,401 99</b>

CHIEF INSPECTOR OF DOMINION CROWN TIMBER OFFICES,  
E. F. STEPHENSON.

## STATEMENT "A"—Summary of work performed and revenue collected at the respective Crown Timber Offices, during the year ended March 31, 1919.

Agency.	Timber and Grazing.							Forestry.				Schools Lands.					Revenue.	
	Bonus	Ground Rent.	Royalty on Seizures	Timber Permits issued.	Timber Seizures.	Hay Permits.	Grazing Rentals.	Sundries.	Permit dues and rentals.	Seizures.	Grazing Rentals.	Hay Permits.	Timber Permits issued.	Seizures.	Hay Permits.	Grazing Permits.		Sundries.
																		\$ cts.
Battleford				199		467	412	43	290	1	110	41	2		528	277	16	10,622 69
Calgary		26	27	210	5	290	493	14	179	8	124	40	7	1	823	854	1	53,274 55
Dauphin				542	39	405	38		1917	75	59	355	16		260	51	2	25,018 15
Edmonton	3	33	34	1184	122	1232	225	596	52	1	29	43	35		656	325	75	79,115 47
Grande Prairie				324	3	323	74	64							43	78		4,508 92
Kamloops	1	54	33	307	3	11	498	69	51	2	8	25						32,039 09
Lethbridge				25		104	1003	19	441	13	252	161			128	355	2	38,155 56
Moose Jaw					1	323	599		100	10	123	151	1		963	877		21,111 41
New Westminster	13	189	239	45	8		2	321					1					94,686 77
Peace River				271	1	369	86					3			51	47	3	4,131 48
Prince Albert		25	49	811	34	614	321		562	5	65	127	45	3	334	228	3	89,970 68
Revelstoke		74	29	89	1			11										17,255 92
Saskatoon				97	8	460	139	1	341	11	85	156	4		690	1346	7	11,519 23
Swift Current				152		489	1302	3	293		202	128			496	595	11	35,765 28
The Pas				41	5	31									4			1,641 60
Winnipeg		91	41	2146	92	1227		138	163	1	170	55	97	18	762			70,498 02
Total	17	492	452	6446	322	6347	5192	1279	4389	127	1227	1285	207	22	5738	5033	120	589,314 82
Previous Year	14	491	372	6010	280	3711	5725	1021	3727	139	633	810	208	13	6719	3937	152	630,268 25

N.B.—Revenue exclusive of payments made to the Department on account of the respective Agencies.



10 GEORGE V, A. 1920

STATEMENT "B," showing Manufacture and Sale of Timber Products for Commercial  
Lands under Yearly License and Permit during

Agency.	Lumber Ft. B. M.			Lath.		
	Manf'd.	Marketed.	On Hand.	Manf'd.	Sold.	On hand.
Calgary.....	11,300,267	10,580,141	4,872,674			
Edmonton.....	26,465,068	28,073,919	4,530,488	4,116,150	4,423,000	23,600
Kamloops.....	18,934,953	18,934,953				
New Westminster.....	76,961,712	76,961,712				
Prince Albert.....	111,852,236	110,841,511	30,334,585	25,618,850	17,402,570	13,647,480
Revelstoke.....	22,411,148	15,000,000	7,411,148			
Winnipeg.....	23,696,131	22,147,978	6,501,146	2,024,100	3,529,850	745,612
Total.....	291,621,515	282,540,214	53,650,041	31,759,100	25,355,420	14,416,692

PERMIT

Calgary.....	995,596	1,244,599	378,588			
Edmonton.....	12,347,794	12,593,514	198,263	112,750	112,750	
Kamloops.....	5,178,784	5,178,784				
New Westminster.....	10,623,258	10,623,258				
Prince Albert.....	4,389,337	4,636,494	897,424			
Revelstoke.....	341,000	341,000				
Winnipeg.....	3,310,608	3,878,441	1,376,200			
Total... ..	37,186,377	38,496,090	2,850,475	112,750	112,750	
Grand total....	328,807,892	321,036,304	56,500,516	31,871,850	25,468,170	14,416,692
Previous year.....	309,388,375	317,061,805	57,950,572	32,911,810	43,327,840	8,013,012



## SESSIONAL PAPER No. 25

Purposes cut by Holders of Timber Berths on Dominion Lands, Forestry and School the Fiscal Year ended March 31, 1919.

Railway Ties	Shingles.		Piling and Mining Props.	Saw Logs.			Fence Post.
	Manf'd sold.	Bolts Cords.		Pcs. Cut.	Manf'd.	On Hand.	
149,130			43,111	206,584	360,064	336,434	
5,704	22,000			387,964	407,495	297,191	
4,918		345	20,841	178,776	178,776	Not known.	54,393
3,023		28,558	26,153	100,031	102,441	2,274	
13,609				946,321	1,881,128	1,102,350	
3,156		2,355	26,891	215,556	215,556	Not known.	713,115
35,007				262,711	452,787	241,881	
214,547	22,000	31,258	116,996	2,297,943	3,598,247	1,980,130	767,508

## BERTHS.

			3,961,083	124,378	80,203	64,011	
772,000			69,650	198,263	184,509	121,772	37,611
15,813		23	61,018	Not known.	Not known.	Not known.	388,970
2,814		6,340	24,633	do	do	do	
				29,713	74,552	7,338	102,395
13,350		250	200	Not known.	Not known.	Not known.	132,100
4,630				47,028	61,308	14,158	
808,607		6,613	4,116,584	399,382	400,572	207,279	661,076
1,023,154	22,000	37,871	4,233,580	2,697,325	3,998,819	2,187,409	1,428,584
1,370,992	34,817	37,206	2,274,249	3,946,685	3,641,153	3,340,359	1,132,508



10 GEORGE V, A. 1920

STATEMENT "C."—Timber Material covered by Permits issued at the respective Agencies, principally to Settlers during the year ending March 31, 1919.

Agency.	Lumber & Logs. Ft. B.M.	Fence Rails.	Poles.	Fence Posts.	Cords Cord-wood.	Railway Ties.	Telegraph & Telephone Poles.	Round Timber Lin. Ft.	Cords Shingle Bolts.
Battleford...	968,376	43,610	8,470	41,595	2,342				
Calgary...	764,044	25,893	5,539	56,943	3,373	16,500	121	156,000	
Dauphin...	7,427,702	15,400	590	127,557	15,838		466		
Edmonton...	6,989,948	750,788	152,927	73,907	2,887	324,724	13,840	926,376	
Grande Prairie...	1,985,130	227,203	145,835	73,201	360				
Kamloops...	5,861,094	19,463	1,665	395,120	5,331	16,813	39,638		29
Lethbridge...	330,250	8,685	370	31,095	3,380			149,806	
Moosejaw...	37,140	240		8,055	630				
New Westminster	10,353,182				533	2,814		24,633	6,235
Peace River...	4,691,765	317,441	105,705	83,055	2,945				
Prince Albert...	4,146,170	143,316	42,858	219,646	22,252				
Revelstoke...	353,300	38,225	25	132,100	588	13,350	200		250
Saskatoon...	1,032,187	5,775	763	30,080	2,118				
Swift Current...			24,795	45,165	3,588		2,000	40,687	
The Pas.....	90,159		350		2,296				
Winnipeg.....	7,325,330	54,255	19,670	236,069	86,286	89,235	7,800	7,876	
Total.....	52,355,777	1,650,294	509,562	1,553,588	154,747	463,436	64,065	1,305,378	6,514
Previous Year..	52,326,965	2,369,764	511,234	1,379,551	155,682	286,508	32,560	4,129,056	14,055

STATEMENT "D." showing the number of Hay Permits issued at the respective Crown Timber Offices and the amount of Hay covered thereby for the year ended March 31, 1919.

Agency.	Dominion Lands.		School Lands.		Forestry Lands.		Revenue.
	No. Pts. issued.	Tons Hay.	No. Pts. issued.	Tons Hay.	No. Pts. issued.	Tons Hay.	
Battleford.....	467	7,996	528	9,031	41	1,777	8 cts. 2,585 95
Calgary .....	278	9,040	806	24,203	35	1,502	3,775 45
Dauphin...	400	9,878	158	3,419	334	7,464	2,723 75
Edmonton..	1,212	17,516	656	9,090	38	2,284	4,816 40
Grande Prairie.....	329	7,367	43	840			977 10
Kamloops.....	11	81			25	212	40 00
Lethbridge...	104	2,111	128	1,514	161	4,482	748 10
Moosejaw...	273	5,335	854	12,229	152	5,684	3,241 05
New Westminster.....							
Peace River.....	369	14,517	47	1,710	3	38	2,702 33
Prince Albert...	719	9,233	334	3,572	127	4,834	2,771 00
Revelstoke .....							
Saskatoon..	360	7,095	690	13,585	156	7,283	3,812 19
Swift Current .....	489	10,440	496	8,374	128	3,335	1,896 35
The Pas .....	30	865					394 00
Winnipeg.....	1,172	15,998	737	10,467	153	2,857	4,741 25
Total.....	6,212	117,472	5,477	98,034	1,353	41,752	35,224 92
Previous Year. ....	3,769	56,661	6,329	103,312	845	23,281	29,109 48



## SCHOOL LANDS DIVISION—W. T. ROLLINS.

By an amendment to section 41 of the Dominion Lands Act, assented to on the 24th May, 1918, provision was made to increase the rate of interest on School Lands disposed of subsequent to the 1st April, 1918, from 5 per cent to 6 per cent per annum. It also provided that all instalments or any portion of any instalment in arrears, whether the principal or interest, would bear interest at the rate of 7 per cent per annum. Further provision was made whereby the Minister might, with the consent of the purchaser or registered assignee, increase the rate of interest to 7 per cent per annum on all arrears owing on sales made prior to April 1, 1918.

The latter provision, no doubt, has been the cause of a large increase in the receipts for the current year.

During the months of May and June, auction sales of school lands were held at thirty-two points in the province of Saskatchewan, and at six points in the province of Alberta.

The total area disposed of in Saskatchewan, including sales to railway companies and for school sites, was 535,065.63 acres, for \$12,060,096, an average of \$22.54 per acre, and in Alberta, 40,310.47 acres for \$1,570,557.19, an average of \$17.39 per acre.

In Manitoba, 131.94 acres were disposed of for \$1,211.64, an average of \$9.19 per acre.

After making deductions for cancelled sales, etc., the approximate area disposed of to March 31, 1919, was as follows:

Province.	Area.	Value.	Average.
Manitoba. . . . .	682,574.60	\$ 6,636,181 87	\$ 9 72
Saskatchewan. . . . .	1,453,849.62	26,053,083 62	17 92
Alberta. . . . .	872,683.57	11,822,771 15	13 55

The value of town lots disposed of to the same date was as follows: Manitoba, \$5,185; Saskatchewan, \$16,433; Alberta, \$41,546.

*Grazing.*—During the fiscal year, 6,804 permits were issued in the three provinces, from which was derived a revenue of \$79,275.73.

*Coal.*—Leases issued, 10. Leases in force, 88. Revenue derived from this source for the three provinces, \$27,786.79.

*Petroleum and gas.*—Leases issued, 97. Leases in force, 301. Revenue produced for three provinces, \$8,900.51.

*Potash.*—Leases issued, 8. Leases in force, 7. Revenue produced for three provinces, \$210.

*Fire clay.*—Leases in force, 3. Revenue produced for three provinces, nil

*Hay.*—Leases issued, 15. Leases in force, 18. Permits issued, 5,513. Revenue produced for three provinces, \$9,817.46.

*Cultivation.*—Permits issued, 51. Revenue produced for three provinces, \$1,055.52.

*Timber.*—Permits issued, 194. Revenue produced for three provinces, \$6,511.26.

*Registration fees.*—The revenue produced from this source in the three provinces amounted to \$1,585.

Statements lettered "A," "B," and "C," respectively, show the revenue collected in the three provinces as classified.



10 GEORGE V, A. 1920

The total net revenue from each province for the fiscal year was as follows:

Manitoba.. . . . .	\$ 657,494 40
Saskatchewan.. . . . .	3,108,331 99
Alberta.. . . . .	1,302,445 99
	<hr/>
	\$5,068,272 38

As provided by several Orders in Council in that behalf, the revenue collected in each province for the fiscal year, less principal moneys of sales and also less expenditure, was paid over to the government of each province. The amounts paid were as follows:

Manitoba—	
Revenue other than principal moneys.. . . . .	\$174,576 26
Less expenditure.. . . . .	15,102 00
	<hr/>
Amount paid to province.. . . . .	\$159,474 26
	<hr/>
Saskatchewan—	
Revenue other than principal moneys.. . . . .	\$561,201 21
Less expenditure.. . . . .	45,990 35
	<hr/>
Amount paid to province.. . . . .	\$515,210 86
	<hr/>
Alberta—	
Revenue other than principal moneys.. . . . .	\$374,817 09
Less expenditure.. . . . .	25,124 71
	<hr/>
Amount paid to province.. . . . .	\$349,692 38
	<hr/>

In addition to the above, the following amounts were paid to the provincial governments as interest on the School Lands Fund for the fiscal year:

Manitoba.. . . . .	\$ 4,446 28
Saskatchewan.. . . . .	21,758 76
Alberta.. . . . .	10,073 85
	<hr/>
Total.. . . . .	\$36,275 89

The total amount paid to each province for the fiscal year was as follows:

Manitoba.. . . . .	\$ 163,920 54
Saskatchewan.. . . . .	536,969 62
Alberta.. . . . .	359,766 23
	<hr/>
Total.. . . . .	\$1,060,656 39

The total expenditure for the fiscal year was as follows:

Manitoba.. . . . .	\$15,102 00
Saskatchewan.. . . . .	45,990 35
Alberta.. . . . .	25,124 71
	<hr/>
Total.. . . . .	\$86,217 06

Statements herewith lettered “D,” “E,” and “F,” respectively, show the balance standing to the credit of the School Lands Fund for each province on the 31st March, 1919, after deducting amounts invested in Dominion of Canada debenture stock, as provided for by Order in Council dated June 7, 1917.

Manitoba—	
Total amount at credit of fund.. . . . .	\$4,801,245 09
Amount invested in debenture stock.. . . . .	4,357,300 00
	<hr/>
Balance at credit of fund.. . . . .	\$ 443,945 09



## SESSIONAL PAPER No. 25

## Saskatchewan—

Total amount at credit of fund.. . . . .	\$7,513,836 89
Amount invested in debenture stock.. . . . .	6,406,300 00
Balance at credit of fund.. . . . .	<u>\$1,107,536 89</u>

## Alberta—

Total amount at credit of fund.. . . . .	\$4,758,058 43
Amount invested in debenture stock.. . . . .	4,170,400 00
Balance at credit of fund.. . . . .	<u>\$ 587,658 43</u>

The following is an approximate statement of the work performed by the School Lands Division during the fiscal year:

Leases prepared in duplicate.. . . . .	130
Agreement forms to pay increased interest and circular letters.. . . .	20,000
Grazing permits issued in quadruplicate.. . . . .	6,804
Cultivation permits issued in duplicate.. . . . .	51
Assignments registered.. . . . .	725
Requisitions for refunds prepared in duplicate.. . . . .	1,113
Requisitions for patents prepared in duplicate.. . . . .	1,113



MANITOBA SCHOOL LANDS.—A.

STATEMENT of Revenue Collected from School Lands for Fiscal Year from April 1, 1918, to March 31, 1919, both dates inclusive.

	Principal.	Interest.	Total.	Cultivation.	Grazing Rent.	Timber.	Hay.	Reg'n Fees.	Coal.	Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Total .....	483,490 72	165,876 79	649,367 51	356 92	3,956 55	2,821 02	2,369 20	4 00	10 00	658,885 20
Reg'n Fees transfd, from Dom. Lands .....								240 00		240 00
Total .....	483,490 72	165,876 79	649,367 51	356 92	3,956 55	2,821 02	2,369 20	244 00	10 00	659,125 20
Office Fees transfd to Dom. Lands .....						27 00	498 50			525 50
Total .....	483,490 72	165,876 79	649,367 51	356 92	3,956 55	2,794 02	1,870 70	244 00	10 00	658,599 70
Refunds .....	572 58	42 02	614 60		269 05	120 75	100 90			1,105 30
Total .....	482,918 14	165,834 77	648,752 91	356 92	3,687 50	2,673 27	1,769 80	244 00	10 00	657,494 40

SASKATCHEWAN SCHOOL LANDS.—B.

STATEMENT of Revenue Collected from School Lands for Fiscal Year from April 1, 1918, to March 31, 1919, both dates inclusive.

	Principal.	Interest.	Total.	Cultivation.	Grazing Rent.	Timber.	Hay.	Registration Fees.	Coal.	Miscellaneous.	Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Total .....	2,551,139 01	512,710 51	3,063,849 52	619 50	47,005 06	697 16	6,311 97	5 00	1,616 72	207 00	3,120,311 93
Reg'n Fees transfd from Dom. Lands .....								686 00			686 00
Total .....	2,551,139 01	512,710 51	3,063,849 52	619 50	47,005 06	697 16	6,311 97	691 00	1,616 72	207 00	3,120,997 93
Office Fees transfd to Dom. Lands .....						10 50	1,426 50				1,437 00
Total .....	2,551,139 01	512,710 51	3,063,849 52	619 50	47,005 06	686 66	4,885 47	691 00	1,616 72	207 00	3,119,560 93
Refunds .....	4,008 23	1,079 37	5,087 60	20 00	5,749 61	12 50	308 95		48 28	2 00	11,228 94
Total .....	2,547,130 78	511,631 14	3,058,761 92	599 50	41,255 45	674 16	4,576 52	691 00	1,568 44	205 00	3,108,331 99



ALBERTA SCHOOL LANDS.—C.

STATEMENT of Revenue Collected from School Lands for Fiscal Year from April 1, 1918, to March 31, 1919, both dates inclusive.

—	Principal.	Interest.	Total.	Cultiva- tion.	Grazing Rent.	Timber.	Hay.	Reg'n Fees.	Coal.	Petroleum & Nat. Gas.	Miscell- aneous.	Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Total .....	930,231 38	298,671 44	1,228,902 82	99 10	37,850 23	3,203 58	4,513 09	6 50	26,243 35	9,040 51	55 00	1,309,914 18
Reg'n Fees transf'd from Dom. Lands ..	.....	.....	.....	.....	.....	.....	.....	643 50	.....	.....	.....	643 50
Total ....	930,231 38	298,671 44	1,228,902 82	99 10	37,850 23	3,203 58	4,513 09	650 00	26,243 35	9,040 51	55 00	1,310,557 68
Office Fees transf'd to Dom. Lands.....	.....	.....	.....	.....	.....	11 00	831 50	.....	.....	.....	.....	842 50
Total .....	930,231 38	298,671 44	1,228,902 82	99 10	37,850 23	3,192 58	3,681 59	650 00	26,243 35	9,040 51	55 00	1,309,715 18
Refunds. ....	2,602 48	695 06	3,297 54	.....	3,517 45	28 75	210 45	.....	35 00	186 00	.....	7,269 19
Total.....	927,628 90	297,976 38	1,225,605 28	99 10	34,332 78	3,163 83	3,471 14	650 00	26,208 35	8,860 51	55 00	1,302,445 99



10 GEORGE V. A. 1920

MANITOBA SCHOOL LANDS.—D.

STATEMENT of Revenue and Expenditure on account of Manitoba School Lands for the Fiscal Year ended March 31, 1919.

Particulars.	Period.	Dr.	Cr.
		\$ cts.	\$ cts.
By balance on April 1, 1918 . . . . .			250,326 95
" sales . . . . .	12 months ended March 31, 1919 . . . . .		648,752 91
" cultivation permits . . . . .	" " . . . . .		356 92
" timber dues, hay permits, grazing rental and coal . . . . .	" " . . . . .		8,140 57
" registration fees . . . . .	" " . . . . .		244 00
" interest on fund . . . . .	" " . . . . .		4,446 28
To cost of management at Ottawa . . . . .	" " . . . . .	5,764 51	
" salaries, printing, advertising and general expenses . . . . .	" " . . . . .	9,337 49	
" revenue and interest paid to Manitoba Government . . . . .	" " . . . . .	159,474 26	
" interest on fund paid to Manitoba Government . . . . .	" " . . . . .	4,446 28	
" investments in 5% debenture bonds . . . . .	" " . . . . .	289,300 00	
" balance March 31, 1919 . . . . .	" " . . . . .	443,945 09	
		912,267 63	912,267 63

NOTE.—Balance at credit of Manitoba Lands Fund on March 31, 1919, was \$4,801,243.09 of which \$4,357,300 is invested in Dominion of Canaba debenture stock maturing October 1, 1919, at 5% per annum, as per Order in Council of June 7, 1917. Interest paid on investments for Fiscal Year 1918-19 totalled \$216,890.

SASKATCHEWAN SCHOOL LANDS.—E.

STATEMENT of Revenue and Expenditure on Account of Saskatchewan School Lands for the Fiscal Year ended March 31, 1919.

Particulars.	Period.	Dr.	Cr.
		\$ cts.	\$ cts.
By balance on April 1, 1918 . . . . .			1,075,706 11
" sales . . . . .	12 months ended March 31, 1919 . . . . .		3,058,761 92
" cultivation permits . . . . .	" " . . . . .		599 50
" timber dues, hay permits, grazing rental, coal and miscellaneous . . . . .	" " . . . . .		48,279 57
" registration fees . . . . .	" " . . . . .		691 00
" interest on fund . . . . .	" " . . . . .		21,758 76
To cost of management at Ottawa . . . . .	" " . . . . .	17,293 54	
" salaries, printing, advertising and general expenses . . . . .	" " . . . . .	28,696 81	
" revenue and interest paid to Saskatchewan Government . . . . .	" " . . . . .	515,210 86	
" interest on fund paid to Saskatchewan Government . . . . .	" " . . . . .	21,758 76	
" investments in 5% debenture bonds . . . . .	" " . . . . .	2,515,300 00	
" balance March 31, 1919 . . . . .	" " . . . . .	1,107,536 89	
		4,205,796 86	4,205,796 86

NOTE.—Balance at credit of Saskatchewan School Lands Fund in March 31, 1919, was \$7,513,836.89 of which \$6,406,300 is invested in Dominion of Canada debenture stock maturing October 1, 1919, at 5% per annum as per Order in Council of June 7, 1917. Interest paid on investments for Fiscal Year 1918-19 totalled \$284,325.



SESSIONAL PAPER No. 25

ALBERTA SCHOOL LANDS.—F.

STATEMENT of Revenue and Expenditure on account of Alberta School Lands for the Fiscal Year ended March 31, 1919.

Particulars.	Period.	Dr.	Cr.
		\$ cts.	\$ cts.
By balance on April 1, 1918.....			731,429 53
" sales . . . . .	12 months ended March 31, 1919		1,225,605 28
" cultivation permits . . . . .	" "		99 10
" timber dues, hay permits, grazing rentals coal, petroleum and miscellaneous . . .	" "		76,091 61
" registration fees.....	" "		650 00
" interest on fund.....	" "		10,073 85
To cost of management at Ottawa . . . . .	" "	11,529 03	
" salaries, printing, advertising and general expenses.....	" "	13,595 68	
" revenue and interest paid to Alberta Government.....	" "	349,692 38	
" interest on fund paid to Alberta Govern- ment... ..	" "	10,073 85	
" investments in debenture bonds.....	" "	1,071,400 00	
" balance March 31, 1919.....	" "	587,658 43	
		2,043,949 37	2,043,949 37

NOTE.—Balance at credit of Alberta School Lands Fund on March 31, 1919, was \$4,758,058.43 of which \$1,170,400 is invested in Dominion of Canada debenture stock maturing October 1, 1919, at 5% per annum as per Order in Council of June 7, 1917. Interest paid on investments for Fiscal Year 1918-19 totalled \$200,020.

LANDS PATENT BRANCH.

Report of N. O. Coté, Controller of Land Patents Branch and Registrar of Dominion Lands Patents, for the fiscal year ended March 31, 1919, with statements in relation thereto, marked A to J, inclusive.

LETTERS PATENT.

The number of letters patent issued during the period mentioned was 16,810, covering an area of 3,063,383 acres, which may be classified as follows:—

Province.	Patents.	Acres.
Manitoba.....	1,478	233,752
Saskatchewan.....	8,855	1,616,013
Alberta.....	6,187	1,176,750
British Columbia.....	266	35,693
Yukon Territory.....	20	1,143
Northwest Territory.....	4	32
	16,810	3,063,383

These grants are given in detail in the statements marked A to G, inclusive, and may be summarized as follows:—

Grants.	Patents.	Acres.
Homesteads . . . . .	9,309	1,479,710
Sales.....	1,581	201,672
Prescription sales.....	4,214	668,333
Purchased homesteads.....	595	91,881
Railways.....	969	514,294
Special or free grants.....	22	4,840
Northwest half-breeds.....	4	501
Military bounty grants.....	1	141
Leases.....	2	786
License of occupation... ..	11	79
Quit claims.....	23	
Hudson's Bay Co.....	6	1,017
Greater Winnipeg Water District (right of way for water supply) . . . . .	3	129
	16,810	3,063,383



10 GEORGE V, A. 1920

There was a decrease of 6,417 patents and 658,249 acres, as compared with the preceding year.

There are recorded in the Land Patents Branch 397,536 letters patent, aggregating 92,044,095 acres, which have been issued since May, 1873, to March 31, 1919.

LANDS DISPOSED OF.

Four thousand two hundred and twenty-seven homestead entries were granted during the year, aggregating an approximate area of 676,320 acres, made up as follows:—

Province.	Homestead Entries.	Acres.
Manitoba.. . . . .	813	
Saskatchewan.. . . . .	1,191	
Alberta.. . . . .	2,169	
British Columbia.. . . . .	54	
	<hr/> 4,227	<hr/> 676,320

There was a decrease in the number of homestead entries granted, as compared with the previous year, of 4,092 entries.

By Land Agencies the 4,227 homestead entries were made up as follows:—

Manitoba—	Entries.
Dauphin.. . . . .	424
LePas.. . . . .	1
Winnipeg.. . . . .	388
	<hr/> 813
Saskatchewan—	
Battleford.. . . . .	142
Moosejaw.. . . . .	206
Prince Albert.. . . . .	535
Saskatoon.. . . . .	122
Swift Current.. . . . .	186
	<hr/> 1,191
Alberta—	
Calgary.. . . . .	220
Edmonton.. . . . .	844
Grande Prairie.. . . . .	558
Lethbridge.. . . . .	163
Peace River.. . . . .	384
	<hr/> 2,169
British Columbia—	
Kamloops.. . . . .	31
New Westminster.. . . . .	13
Revelstoke.. . . . .	10
	<hr/> 54

The 4,227 entrants for homesteads represented 10,710 persons, as compiled from the information obtained from each entrant. Of these entries 1,388 were made by residents of the several provinces of the Dominion; six by Canadians who have returned from the United States, and 606 by persons who had obtained homestead entries, but which had been either cancelled by default or at the request of the entrants in order, in most cases, to enter for other lands; 908 were made by persons from the British Isles; 870 were by Americans; 38 by naturalized Austro-Hungarians; 97 Russians and Finns; 83 by Norwegians; 60 by Swedes; 7 by naturalized



## SESSIONAL PAPER No. 25

Germans; 38 by Frenchmen; 19 by Belgians, and the remaining 107 were made by citizens of various other countries.

The privilege of pre-emption entry and purchased homestead entry, as provided for by the Dominion Lands Act 1908, was withdrawn by section 28, chapter 19, S-9 George V, assented to 24th May, 1918. The granting of pre-emption entries and purchased homestead entries had been previously discontinued from and after the 20th March, 1918, by Order of the Governor in Council of the 16th March, 1918.

## CANCELLED ENTRIES.

There were cancelled during the same period 4,634 entries, made up as follows:—

	Manitoba.	Saskatchewan.	Alberta.	British Columbia.
Homesteads . . . . .	929	1,100	1,946	140
Pre-emptions . . . . .	1	301	199	
Purchased Homesteads . . . . .		13	2	
Sales . . . . .		1	2	
Total . . . . .	930	1,415	2,149	140

## SALES.

Five hundred and thirty-seven sales were made during the fiscal year for 20,469 acres of land, with an average for each sale of about 38½ acres.

## NEWLY SURVEYED LANDS THROWN OPEN TO HOMESTEAD ENTRY.

During the past fiscal year newly surveyed lands comprised in forty-six townships were made available for homestead entry in the following land agencies:—

Edmonton, Alberta, in twenty-three townships; Peace River, Alberta, in seven townships and Grande Prairie, Alberta, in sixteen townships.

## ACCOUNTS AND REVENUE.

There are at present kept in the Branch about 40,000 accounts in connection with purchased homesteads, pre-emptions and ordinary sales.

During the fiscal year \$2,173,490.07, including \$271,335.78 interest on deferred payments, was received on account of purchased homesteads, pre-emptions and ordinary sales, being a decrease of \$796,770.69, as compared with the payments received during the previous year.

## REFUNDS.

There were 1,780 refunds made, amounting to \$60,295.89, as follows:—

On account of improvements on cancelled homesteads, 727 refunds..	\$43,419 68
Overpayments on sales and moneys paid on cancelled purchased homestead entries and pre-emption sales, 1,053 refunds.. . . .	16,876 21
	<u>\$60,295 89</u>



A.

STATEMENT OF LETTERS PATENT covering Dominion Lands situate in Manitoba, Saskatchewan, Alberta, Northwest Territories, British Columbia and the Yukon Territory issued from the Department of the Interior during the fiscal year ending March 31, 1919, as compared with the fiscal year ending March 31, 1918, and recorded in the Land Patents Branch.

No.	Nature of Grant.	From April 1, 1918 to March 31, 1919.		From April 1, 1917 to March 31, 1918	
		Patents.	Acres.	Patents.	Acres.
1	Alberta Railway and Irrigation Co's sales .....	34	61,267	25	13,276
2	British Columbia homesteads .....	149	19,015	121	15,255
3	British Columbia sales .....	15	2,140	31	612
4	Coal surface sales .....	4	772	2	6
5	Greater Winnipeg Water District .....	3	129		
6	Homesteads .....	9,065	1,445,425	14,318	2,301,330
7	Homesteads, Peace River Block .....	89	14,230	104	16,571
8	Hudson's Bay Co .....	6	1,017		
9	Leases .....	2	786		
10	License of occupation .....	11	79	44	331
11	Military bounty grants .....	1	141	1	159
12	Military homesteads .....	1	320	1	322
13	Mining lands sales .....	7	405	9	455
14	Mineral rights (676 acres) .....	3		4	
15	Northwest half breed grants .....	4	501	5	797
16	Parish sales .....	1		3	1,163
17	Presumption sales .....	4,214	668,333	6,138	976,395
18	Purchase of homesteads .....	595	91,881	876	137,253
19	Quit claim, special grants (2,433 acres) .....	23		25	
	Railways: -				
20	Alberta and Great Waterways Railway Co.....	24	317	30	418
21	Calgary and Edmonton Railway Co.....	213	226,645	122	46,915
22	Canadian Northern Alberta Railway Co .....	78	531	1	6
23	Canadian Northern Railway Co.....	60	28,159	46	37,262
24	Canadian Northern Manitoba Railway Co.....	4	73		
25	Canadian Northwestern Railway Co.....	26	319	1	2
26	Canadian Pacific Railway grants.....	23	923	26	222
27	Canadian Pacific Railway roadbed and station grounds .....	16	71	21	70
28	Central Canada Railway Co.....	19	235	14	191
29	Edmonton, Dunvegan and British Columbia Railway Co.....	81	1,099	74	1,285
30	Grand Trunk Pacific Railway.....	3	27	11	222
31	Grand Trunk Pacific Branch Lines Co.....	3	43	9	74
32	Kootenay Central Railway Co .....			1	1
33	Manitoba and Northwestern Railway Co.....	1	153	5	11
34	Or'Appelle Long Lake and Saskatchewan Railroad and Steamboat Co .....	418	255,699	147	35,617
35	Sales .....	390	23,490	376	34,299
36	Sales, Peace River Block .....	2	190		
37	School lands sales .....	1,110	212,985	562	96,844
38	Special grants .....	92	4,840	66	4,096
39	Yukon Territory homesteads .....	5	720		
40	Yukon Territory sales. (52 acres, Under rights) ..	15	423	8	172
	Totals .....	16,810	3,063,383	23,227	3,721,632



## SESSIONAL PAPER No. 25

## B.

STATEMENT OF LETTERS PATENT covering Dominion Lands situate in the Province of Manitoba, issued from the Department of the Interior during the fiscal year ending March 31, 1919, as compared with the fiscal year ending March 31, 1918, and Recorded in the Land Patents Branch.

No.	Nature of Grant.	From April 1, 1918, to March 31, 1919.		From April 1, 1917, to March 31, 1918.	
		Patents.	Acres.	Patents.	Acres.
1	Greater Winnipeg Water District.....	3	129		
2	Homesteads.....	1,072	167,701	1,138	183,242
3	Mining lands, sales.....	6	276	8	301
4	Northwest half-breed grants.....	2	240		
5	Parish sales.....	1		2	377
6	Pre-emption sales.....	4	640	2	279
7	Quit claim, special grants (93 acres).....	4		1	
	Railways:—				
8	Canadian Northern Railway Co.....	19	232	4	61
9	Canadian Northern Manitoba Railway Co.....	4	73		
10	Canadian Pacific Railway grants.....	1	6	1	7
11	Canadian Pacific Ry. roadbed and station grounds.....	8	6	17	28
12	Grand Trunk Pacific Railway Co.....			1	1
13	Manitoba and Northwestern Railway Co.....			2	3
14	Sales.....	36	1,956	41	2,198
15	School lands sales.....	314	62,133	147	28,436
16	Special grants.....	4	360	7	62
	Totals.....	1,478	233,752	1,371	214,996

## C.

STATEMENT OF LETTERS PATENT covering Dominion Lands situate in the Province of Saskatchewan, issued from the Department of the Interior during the fiscal year ending March 31, 1919, as compared with the fiscal year ending March 31, 1918, and recorded in the Land Patents Branch.

No.	Nature of Grant.	From April 1, 1918, to March 31, 1919.		From April 1, 1917, to March 31, 1918.	
		Patents.	Acres.	Patents.	Acres.
1	Homesteads.....	4,554	729,282	7,794	1,251,722
2	Hudson's Bay Co.....	2	389		
3	License of occupation.....	8	71	20	92
4	Military homesteads.....	1	320	1	322
5	Mineral rights (20 acres).....	1			
6	Northwest half-breed grants.....	1	160	2	319
7	Pre-emption sales.....	2,849	452,314	3,722	591,615
8	Purchased homesteads.....	418	64,823	593	92,765
9	Quit claim, special grants, (660 acres).....	10		21	
	Railways:—				
10	Calgary and Edmonton Railway Co.....	6	9,444	1	159
11	Canadian Northern Railway Co.....	38	27,901	42	37,201
12	Canadian Pacific Railway grants.....	1	2	25	215
13	Canadian Pacific Railway roadbed and station grounds.....	1	3	3	33
14	Grand Trunk Pacific Railway.....			6	19
15	Grand Trunk Pacific Branch Lines Co.....			1	6
16	Manitoba and Northwestern Railway Co.....	1	153	3	8
17	Qu'Appelle Long Lake and Saskatchewan Railroad and Steamboat Co.....	418	255,699	147	35,617
18	Sales.....	157	11,761	106	14,619
19	School lands sales.....	362	61,612	19	26,721
20	Special grants.....	27	2,079	28	2,206
	Totals.....	8,855	1,616,013	12,765	2,053,639



D.

STATEMENT OF LETTERS PATENT covering Dominion Lands situate in the Province of Alberta, issued from the Department of the Interior during the fiscal year ending March 31, 1919, as compared with the fiscal year ending March 31, 1918, and recorded in the Land Patents Branch.

No.	Nature of Grant.	From April 1, 1918, to March 31, 1919.		From April 1, 1917, to March 31, 1918.	
		Patents.	Acres.	Patents.	Acres.
1	Alberta Railway and Irrigation Co.'s sales.. . . .	34	61,267	25	13,276
2	Coal surface sales..... . . . .	4	772	2	6
3	Homesteads .....	3,439	548,442	5,386	866,365
4	Hudson's Bay Co..... . . . .	3	622	—	—
5	Leases..... . . . .	1	765	—	—
6	License of occupation .....	3	8	24	239
7	Military bounty grants .....	1	141	1	159
8	Mining lands sales .....	1	129	1	154
9	Mineral rights (656 acres) .....	2	—	4	—
10	Northwest half-breed grants..... . . . .	1	101	3	478
11	Parish sales .....	—	—	1	786
12	Pre-emption sales..... . . . .	1,361	215,379	2,414	384,501
13	Purchased homesteads. .... . . . .	175	27,040	282	44,477
14	Quit claim, special grants (1,680 acres)..... . . . .	9	—	3	—
Railways:					
15	Alberta and Great Waterways Railway Co. ....	24	317	30	418
16	Calgary and Edmonton Railway Co. .... . . . .	207	217,201	121	46,756
17	Canadian Northern Railway Co..... . . . .	3	26	—	—
18	Canadian Northern Alberta Railway Co..... . . . .	78	531	1	6
19	Canadian Northwestern Railway Co .....	26	319	1	2
20	Canadian Pacific Railway grants .....	20	900	—	—
21	Canadian Pacific Railway roadbed and station grounds .....	1	8	—	—
22	Central Canada Railway Co..... . . . .	19	235	14	191
23	Edmonton, Dunvegan and British Columbia Railway Co..... . . . .	81	1,099	74	1,285
24	Grand Trunk Pacific Railway .....	3	27	4	202
25	Grand Trunk Pacific Branch Lines Co..... . . . .	3	43	8	68
26	Sales. .... . . . .	194	9,747	167	17,466
27	School lands sales..... . . . .	434	89,240	225	41,687
28	Special grants..... . . . .	60	2,391	28	1,813
Totals .....		6,187	1,176,750	8,819	1,420,335



## SESSIONAL PAPER No. 25

## E.

STATEMENT OF LETTERS PATENT covering Dominion Lands situate in the Province of British Columbia, issued from the Department of the Interior during the fiscal year ending March 31, 1919, as compared with the fiscal year ending March 31, 1918, and recorded in the Land Patents Branch.

No.	Nature of Grant.	From April 1, 1918, to March 31, 1919.		From April 1, 1917 to March 31, 1918.	
		Patents.	Acres.	Patents.	Acres.
1	British Columbia homesteads.....	149	19 015	121	15,255
2	British Columbia sales.....	15	2,140	31	612
3	Homesteads, Peace River Block.....	89	14,230	104	16,571
4	Leases.....	1	21	—	—
5	Purchased homesteads.....	2	18	1	11
	Railways:				
6	Canadian Pacific Railway grants.....	1	15	—	—
7	Canadian Pacific Railway roadbed and station grounds.....	6	54	1	9
8	Kootenay Central Railway Co. ....	—	—	1	1
9	Sales—Peace River Block.....	2	190	—	—
10	Special grants.....	1	10	2	10
	Totals.....	266	35,693	261	32,469

## F.

STATEMENT OF LETTERS PATENT covering Dominion Lands situate in the Yukon Territory, issued from the Department of the Interior during the fiscal year ending March 31, 1919, as compared with the fiscal year ending March 31, 1918, and recorded in the Land Patents Branch.

No.	Nature of Grant.	From April 1, 1918 to March 31, 1919.		From April 1, 1917 to March 31, 1918.	
		Patents.	Acres.	Patents.	Acres.
1	Yukon Territory homesteads.....	5	720	—	—
2	Yukon Territory sales (52 acres, Under rights)....	15	423	8	172
	Totals.....	20	1,143	8	172

## G.

STATEMENT OF LETTERS PATENT covering Dominion Lands situated in the Northwest Territories, issued from the Department of the Interior during the fiscal year ending March 31, 1919, as compared with the fiscal year ending March 31, 1918, and recorded in the Land Patents Branch.

No.	Nature of Grant.	From April 1, 1918 to March 31, 1919.		From April 1, 1917 to March 31, 1918.	
		Patents.	Acres.	Patents.	Acres.
1	Hudson's Bay Co.....	1	6	—	—
2	Sales.....	3	26	2	16
3	Special grants.....	—	—	1	5
	Totals.....	4	32	3	21



10 GEORGE V, A. 1920

H.

STATEMENT showing the number of Homestead Entries made during the fiscal year ending March 31, 1919, the Nationality of the Homesteaders and the Provinces in which the entries were made.

Nationalities.	Provinces.				Total.
	Manitoba.	Saskat- chewan.	Alberta.	British Columbia.	
Canadians from Ontario .....	100	210	283	6	599
do do Quebec .....	36	93	130	1	260
do do Nova Scotia .....	7	16	29	1	53
do do New Brunswick .....	4	4	23	...	31
do do Prince Edward Island.....	1	3	12	1	17
do do Manitoba .....	132	55	49	2	238
do do Saskatchewan.....	10	50	15	..	75
do do Alberta .....	...	4	82	1	87
do do British Columbia.....	1	1	18	8	28
Persons who had previous entry..	117	159	324	6	606
Newfoundlanders.....	...	...	1	1	2
Canadians returned from the United States.....	...	2	4	...	6
Americans .....	49	264	151	6	470
English.....	173	147	311	8	639
Scotch .....	52	37	88	5	182
Irish.....	24	25	37	1	87
French .....	21	7	10	...	38
Belgians .....	7	6	6	...	19
Swiss.....	...	2	6	...	8
Italians.....	...	2	17	..	21
Roumanians.....	...	6	1	...	7
Syrians .....	...	1	..	...	1
Germans.....	1	...	6	...	7
Austro-Hungarians.....	25	8	5	...	38
Hollanders .....	3	2	10	...	15
Danes (other than Icelanders) .....	1	5	23	...	29
Icelanders.....	10	...	...	...	10
Swedes .....	3	23	31	3	60
Norwegians ..	7	22	54	...	83
Russians (other than Finns)...	13	29	31	1	74
Finns .....	15	4	3	1	23
Serbians.....	...	...	1	...	1
Bulgarians.....	...	...	...	...	...
Chinese.....	...	...	4	...	4
Japanese.....	1	1	...	...	2
Persians .....	...	...	...	...	...
Australians .....	...	...	1	...	1
New Zealanders...	...	...	...	...	...
Hindoos .....	...	...	...	...	...
Greeks.....	...	1	...	...	1
Poles.....	...	2	1	...	3
Montenegrins.....	...	...	2	...	2
Total .....	813	1,191	2,169	54	4,227

Number of souls represented by above entries 10,710.



## SESSIONAL PAPER No. 25

## I.

STATEMENT showing the number of Homestead Entries made in the Province of Manitoba, Saskatchewan, Alberta and British Columbia during the fiscal year ending March 31, 1919, by persons coming from the United States of America.

States.	Provinces.				Total.
	Manitoba.	Saskatche- wan.	Alberta.	British Columbia.	
Alabama .....			2		2
Alaska .....					
Arizona .....					
Arkansas .....		1	2		3
California .....		1	3		4
Carolina, North .....			8		8
Carolina, South .....			1		1
Colorado .....		2	6		8
Columbia, District of .....					
Connecticut .....			2		2
Dakota, North .....	12	38	41		91
Dakota, South .....	1	5	11		17
Delaware .....					
Florida .....		1			1
Georgia .....					
Idaho .....		2	7		9
Illinois .....	5	16	29	2	52
Indiana .....	3	4	23		30
Indian Territory .....					
Iowa .....	7	18	34	1	60
Kansas .....		7	11		18
Kentucky .....		8	7		15
Louisiana .....		1	1		2
Maine .....		2	6		8
Maryland .....		2			2
Massachusetts .....	1	11	9		21
Michigan .....	3	17	48		68
Minnesota .....	6	57	86		149
Mississippi .....					
Missouri .....		5	21		26
Montana .....	1	7	11		19
Nebraska .....		4	21		25
Nevada .....					
New Hampshire .....	1	2	3		6
New Jersey .....		1	3		4
New Mexico .....			8		8
New York .....	1	5	18		24
Ohio .....	2	6	13		21
Oklahoma .....			8		8
Oregon .....		2	13		15
Pennsylvania .....		9	15	1	25
Rhode Island .....		3	2		5
Tennessee .....		1	1		2
Texas .....		5	7		12
Utah .....			10		10
Vermont .....	1	2	5		8
Virginia .....			2		2
Virginia, West .....			2		2
Washington .....		4	20	1	25
Wisconsin .....	5	17	29	1	52
Wyoming .....					
Total.	49	266	355	6	876



REPORT OF THE ACTING SUPERINTENDING ACCOUNTANT.—G. D. POPE.

Statements of revenue collected from various sources during the fiscal year ended March 31, 1919, as follows:—

A. Dominion lands, including Yukon.. . . .	\$3,615,958 52
B. Ordnance lands... ..	4,819 27
C. School lands.. . . .	5,087,875 81
D. Registration fees, Yukon.. . . .	789 22
E. Fines and forfeitures, N.W.T.. . . .	35 00
F. Casual revenue.. . . .	12,381 71
G. Seed grain and relief repayments.. . . .	1,378,275 76
H. Sales of land, special account.. . . .	239,075 10
Total.. . . .	<u>\$10,339,210 39</u>

A statement of revenue on account of Dominion Lands (marked I) shows the receipts, classified under subheads.

Statement (marked J) shows a comparison between the receipts on account of revenue for the previous twelve months.

DOMINION LANDS REVENUE (Cash and Scrip) for the fiscal year ending March 31, 1919.

Agencies.	Cash.	Scrip.	Total
	\$ cts.	\$ cts.	\$ cts.
<i>Yukon Territory—</i>			
Sales of land .....	593 46		593 46
Rentals of land. ....	11,648 07		11,648 07
Map sales, office fees, etc.....	17 50		17 50
Timber dues.....	7,936 23		7,936 23
Hay permits.....	30 55		30 55
Mining fees.....	37,446 65		37,446 65
Export tax on gold.....	48,677 07		48,677 07
Free certificates for export of gold.....	10 50		10 50
Hydraulic leases.....	4,393 72		4,393 72
Dredging leases .....	1,695 10		1,695 10
Homestead fees.....	30 00		30 00
Interim Receipt Account.....	15 00		15 00
	<u>112,493 85</u>		<u>112,493 85</u>
<i>Dominion Lands Agencies—</i>			
Battleford.....	57,712 66		57,712 66
Calgary.....	402,754 91	293 41	403,048 32
Dauphin .....	8,196 98		8,196 98
Edmonton. ....	29,406 09		29,406 09
Grande Prairie.....	11,639 54		11,639 54
Kamloops .....	7,098 03		7,098 03
Lethbridge.....	194,733 54		194,733 54
Moosejaw. ....	519,798 79		519,798 79
New Westminster.....	1,773 36		1,773 36
Peace River.....	8,012 10		8,012 10
Prince Albert.....	15,309 74		15,309 74
The Pas .....	145 20		145 20
Revelstoke.....	1,610 34		1,610 34
Saskatoon .....	256,522 66		256,522 66
Swift Current.....	744,052 30		744,052 30
Winnipeg.....	20,991 37		20,991 37
	<u>2,279,757.61</u>	<u>293 41</u>	<u>2,280,051 02</u>



## SESSIONAL PAPER No. 25

DOMINION LANDS REVENUE (Cash and Script) for the fiscal year ended March 31, 1919  
—Concluded.

Agencies.	Cash.	Script.	Total
	\$ cts.	\$ cts.	\$ cts.
<i>Crown Timber Agencies—</i>			
Battleford .....	902 02		902 02
Calgary .....	27,295 79		27,295 79
Dauphin .....	22,174 59		22,174 59
Edmonton .....	64,118 21		64,118 21
Grande Prairie .....	1,011 48		1,011 48
Kamloops .....	23,295 45		23,295 45
Lethbridge .....	1,856 24		1,856 24
Moosejaw .....	408 85		408 85
New Westminster .....	96,723 84		96,723 84
Peace River .....	625 30		625 30
Prince Albert .....	83,560 96		83,560 96
The Pas .....	1,247 60		1,247 60
Revelstoke .....	15,923 71		15,923 71
Saskatoon .....	1,291 63		1,291 63
Swift Current .....	660 73		660 73
Winnipeg .....	59,695 65		5 695 65
	400,792 05		400,792 05
<i>Miscellaneous—</i>			
Rocky Mountain Park .....	46,978 49		46,978 49
Jasper Park .....	4,285 91		4,285 91
Yoho Park .....	1,074 38		1,074 38
Waterton Lakes Park .....	1,992 95		1,992 95
Elk Island Park .....	10 25		10 25
Buffalo Park .....	145 95		145 95
Glacier Park .....	43 22		43 22
Fort Anne Park .....	116 37		116 37
Antelope Park .....	195 20		195 20
Revelstoke Park .....	20 00		20 00
Moose Mountain Buffalo Park .....	102 40		102 40
Point Pelee Park .....	31 60		31 60
Lac la Biche .....	10 00		10 00
Survey fees .....	48,287 00		48,287 00
Irrigation fees .....	483 87		483 87
Map sales, office fees, etc. ....	8,940 17		8,940 17
Fees Board of Examiners, D.L.S. ....	100 00		100 00
Mining fees .....	14,895 60		14,895 60
Grazing lands .....	148,179 55		148,179 55
Grazing lands (improvements) .....	560 00		560 00
Hay permits .....	22,054 51		22,054 51
Coal lands .....	375,895 14		375,895 14
Dredging leases .....	50 00		50 00
Stone quarries .....	8,221 59		8,221 59
Rent of water power .....	1,452 32		1,452 32
Suspense Account .....	6,837 93		6,837 93
Petroleum .....	107,230 41		107,230 41
Sand, stone and gravel .....	1,104 44		1,104 44
Forestry Branch—sale of trees, etc .....	2,604 17		2,604 17
Fishing permits .....	824 00		824 00
General sales .....	2,493 80		2,493 80
Rentals .....	651 84		651 84
Miscellaneous .....	1,579 47		1,579 47
Irrigation sales .....	11,556 38	30 00	11,586 38
Potash leases .....	3,906 10		3,906 10
	822,915 01	30 00	822,945 01
Total revenue .....	3,615,958 52	323 41	3,616,281 93
Less refunds .....	76,031 02		76,031 02
	3,539,927 50	323 41	3,540,250 91



10 GEORGE V, A. 1920

STATEMENT of Ordinance Lands revenue for the fiscal year ended March 31, 1919.

Fiscal Year.	Gross Revenue	Refunds.	Net Revenue.
	\$ cts.		\$ cts.
1918-1919....	4,819 27	.....	4,819 27

STATEMENT of Receipts on account of School Lands for the fiscal year ended March 31, 1919.

Manitoba School Lands.	Saskatchewan School Lands.	Alberta School Lands.	Total.
\$ cts.	\$ cts.	\$ cts.	\$ cts.
658,599 70	3,119,560 93	1,309,715 18	5,087,875 81

STATEMENT of Registration Fees in the Yukon Territory for the fiscal year ended March 31, 1919.

Fiscal Year.	Gross Revenue.	Land Assurance Fund.	Net Revenue.
	\$ cts.	\$ cts.	\$ cts.
1918-1919....	789 22	49 62	739 60

STATEMENT of Fines and Forfeitures for the fiscal year ended March 31, 1919.

Fiscal Year.	Gross Revenue.	Refunds.	Net Revenue.
	\$ cts.		\$ cts.
1918-1919.....	35 00	.....	35 00

STATEMENT of Casual Revenue for the fiscal year ended March 31, 1919, \$12,356.71.

STATEMENT showing net repayments on account of seed grain and relief mortgages for the fiscal year ended March 31, 1919.

Year.	Gross Collections.	Refunds.	Net Receipts,
	\$ cts.	\$ cts.	\$ cts.
1876.....	824 62	160 70	663 92
1886-7-8.....	1,191 66	.....	1,191 66
1890.....	8 35	.....	8 35
1894.....	.....	112 27	Minus 112 27
1895 ..	223 67	.....	223 67
1896 ..	66 23	.....	66 23
1901.....	145 52	.....	145 52
1905 ..	83 83	.....	83 83
1908 ..	4,122 58	46 59	4,075 99
1909.....	337 63	.....	337 63
1911.....	6,285 52	63 49	6,222 03
1912.....	7,614 59	178 79	7,435 80
1913.....	1,125 87	33 60	1,092 27
1914.....	5,085 32	.....	5,085 32
1915, Seed Grain...	843,875 18	15,514 11	828,361 37
1915, Relief .....	480,722 32	16,219 99	464,502 33
1917.....	9,450 67	2 00	9,448 67
1918.....	13,015 85	345 83	12,670 02
Relief Advances.....	4,096 05	37 23	4,058 82
	1,378,275 76	32,714 60	1,345,561 16



## SESSIONAL PAPER No. 25

DOMINION LANDS REVENUE (Cash and Scrip) for the fiscal year ended March 31, 1919, credited to the special accounts of the following railway companies.

Railway Company.	Date of Order in Council.	Amount.	Total.
Calgary and Edmonton Railway.....	August 17, 1908 .....	\$ 97,429 20	
Lake Manitoba Railway and Canal Co. }	December 5, 1908.....	141,645 90	
Canadian Northern Railway System... }			
	Total.....		\$239,075 10

STATEMENT of gross cash receipts on account of Dominion Lands Revenue for the fiscal year ended March 31, 1919.

Homestead fees .....	\$ 42,190 00
Sale fees .....	170 00
Improvements.....	49,225 97
General sales of land.....	2,192,860 81
Timber dues .....	408,728 28
Rental from grazing lands .....	148,179 55
Export tax on gold, hay, coal, petroleum, mining fees, etc.....	630,975 74
Canadian National Parks.....	55,006 72
Survey fees .....	48,287 00
Map sales, rentals, office fees and miscellaneous .....	40,334 45
Total.....	\$3,615,958 52

STATEMENT of gross receipts (Cash and Scrip) on account of Dominion Lands Revenue for the fiscal year ended March 31, 1919, compared with the previous fiscal year.

Particulars.	1918-1919	1917-1918	Increase.	Decrease.	Net Decrease.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Dominion Lands Agencies.....	2,280,051 62	3 219,191 03		939,140 01	
Crown Timber Agencies.....	400,792 05	469,767 94		68,975 89	
Hay, Mining, Coal, Grazing, etc.	767,938 29	665,881 27	102,057 02		
Yukon Territory .....	112,493 85	150,809 32		38,315 47	
Canadian National Parks .....	55,006 72	52,160 52	2,846 20		
	3,616,281 93	4,557,810 08	104,903 22	1,046,431 37	941,528 15

During the fiscal year ending March 31, 1919, there were no public sales of Ordnance Lands held; but with respect to the land formerly sold or occupied under lease, with option to purchase, four parcels or lots situated in the several localities hereunder mentioned, and in the annexed statement marked "A," have been fully paid and letters-patent issued therefor.

1. *Grand Falls, N.B.*—One Town Lot, No. 15, located within the boundaries of this reserve was paid for in full during the last fiscal year, the sum of \$127.70 having been received, and letters-patent issued.

2. *Ottawa.*—Ordnance lands in this locality are occupied by tenants under leases originally granted by the Imperial authorities, in which it is provided that the lessees may, upon payment in cash of the purchase price in full for the land occupied, convert their leasehold into freehold, and obtain Crown Patent, of these parcels or lots, two half lots were paid for in full and letters-patent issued. The amount of the purchase money received within the last fiscal year was \$225.45.



TO GEORGE V, A. 1920

3. *Port Maitland*.—This reserve is situated on the westerly side of the Grand River at its confluence with Lake Erie in the Township of Dunn, County of Haldimand. It was surveyed and subdivided by the authority of the department in 1916 and the squatters, by whom the land was occupied, were permitted to purchase their holdings at a valuation or lease the same for a period of years at a reasonable annual rental with the option of purchase. During the past fiscal year one of these squatters took advantage of the privilege offered and paid the purchase price in full for his holding, amounting to \$24.63, and received letters-patent therefor.

The following statements are hereto annexed:—

A.

STATEMENT giving the number of Lots and part Lots sold or redeemed, the amounts for which such Lots were originally disposed of and the sum received as instalment or balance of purchase money during the fiscal year ended the 31st March, 1919.

Locality.	No. of Lots sold or redeemed.	Amount of consideration of purchase money.	Amount received on account during fiscal year.	Remarks.
		\$ cts.	\$ cts.	
Port Maitland . . . . .	1 Town Lot.	24 63	24 63	In full.
Ottawa . . . . .	1 Town Lot.	120 00	128 70	"
Ottawa . . . . .	1 Town Lot.	90 00	96 75	"
Grand Falls . . . . .	1 Town Lot.	105 00	120 70	"
		339 63	377 78	

B.

STATEMENT naming the various Localities where Ordnance Lands are situated on account of which moneys have been received during the fiscal year ended the 31st March, 1919.

Amherstburg . . . . .	\$ 2 00
Burlington Beach . . . . .	60 00
Carillon . . . . .	20
Chambly . . . . .	331 00
Edmundston . . . . .	1 00
Elmsley . . . . .	10 20
Fort Cumberland . . . . .	64 00
Fort Erie . . . . .	2 00
Grand Falls . . . . .	137 70
Grenville . . . . .	7 20
Kingston . . . . .	203 50
Montague . . . . .	8 00
Nepean . . . . .	1 00
Ottawa . . . . .	916 37
Owen Sound . . . . .	61 50
Oxford . . . . .	33 35
Point Edward . . . . .	200 00
Point Pelee . . . . .	19 73
Port Maitland . . . . .	70 27
Prescott . . . . .	2 00
Quebec . . . . .	880 00
Queenston . . . . .	4 00
St. Croix River . . . . .	1 00
St. Joseph Island . . . . .	5 00
Sorel . . . . .	1,674 00
Storrington . . . . .	1 00
Wolford . . . . .	100 00
	\$ 4,796 02
Fees . . . . .	23 25
	\$ 4,819 27



C.

STATEMENT showing the receipts each month of the year classified as fees, rents, or interest equivalent to rent and principal for the fiscal year ended the 31st March, 1919.

Fees.....	\$ 23 25
Rent or interest.....	4,368 99
Principal.....	427 03
Total.....	\$ 4,819 27

D.

STATEMENT showing amounts due and unpaid on account of purchase money and rent or interest for the fiscal year ended the 31st March, 1919.

Locality.	Rent or Interest.	Principal.	Total.
	\$ cts.	\$ cts.	\$ cts.
Burlington Beach ..	100 00	100 00	100 00
Beaver Harbour.....	8 00	8 00	8 00
Chambly.....	161 00	161 00	161 00
Dalhousie.....	24 84	24 84	24 84
Fort Erie ..	100 00	100 00	100 00
Grand Falls.....	418 96	418 96	418 96
Marlborough.....	11 00	11 00	11 00
Niagara.....	734 95	734 95	734 95
Nepean ..	208 32	208 32	208 32
Owen Sound.....	33 25	33 25	33 25
Oxford.....	2 50	2 50	2 50
Oromocto.....	0 50	0 50	0 50
Ottawa ..	811 27	811 27	811 27
Port Maitland.....	35 00	35 00	35 00
Presqu'isle ..	4 00	4 00	4 00
Sorel ..	100 72	100 72	100 72
Tay ..	40 00	40 00	40 00
Wolford.....	102 40	102 40	102 40
	645 69	2,251 02	2,896 71







PART II.

DOMINION PARKS BRANCH.







## DOMINION PARKS.

---

### REPORT OF THE COMMISSIONER, J. B. HARKIN.

Though the war ended during the fiscal year 1918-19 the work in connection with the Dominion Parks Branch necessarily was continued throughout the year on a war basis. In other words there were but two main features, the maintenance of the existing roads, bridges, trails, etc., with the minimum of expenditure; and the preparation of plans for extension of the work in future years. Details with respect to the work done are covered in the reports herewith from the superintendents of the individual parks.

Throughout the year the work in connection with the parks service has been planned and carried out primarily with a view to bringing into Canada a revenue of millions of dollars from foreign tourist traffic. Special attention has been given to this subject because it is recognized that on account of the war debt it is vital that Canada should concentrate on the development of revenue producing activities.

The object lesson of Switzerland and other European countries has taught the world that outstanding scenic and recreation areas are as distinctly natural resources as timber, minerals or agricultural crops, and that trade (tourist traffic) in them is capable of producing national revenue just as successfully as trade in any of the other natural assets.

A celebrated English Alpinist asserted some years ago that Canada's mountain areas are destined to become "the playground of the world." Canada's national parks contain the most attractive portions of the mountains and therefore are the potential "playground of the world."

The planning of parks work has been based upon an analysis of the tourist business of preceding years.

Publicity experts at the Pacific Coast estimate at \$350 the average expenditure of each foreign tourist. But allowing for an expenditure by each foreign visitor to the Rockies of only \$250, and this includes the ever-increasing numbers who remain the entire season and spend many times that much and those who go out with pack trains to the outlying portions of the park who often spend thousands, it is clear that the money brought into Canada by these visitors reaches a very large sum. Take the year 1915, the last year in which owing to war conditions there was a heavy tourist travel from the States. The number of visitors to Rocky Mountains Park in that year was approximately 90,000. Over 65,000 of these visitors were foreigners. Allowing for an expenditure of \$250 each it follows that over \$16,000,000 of foreign money was brought into Canada by the people of other countries who were attracted to this park, which is just the same as if we had exported goods to those countries and received money in return. Now it is interesting to compare the value on an acreage basis of our exports of wheat with what we may call our export in scenery. The acreage of Rocky Mountains Park in 1915 was 1,800 square miles, or 1,152,000 acres, and the value of the foreign tourist traffic it attracted was roughly speaking \$16,000,000. This works out to a per acreage value of \$13.88.

The total wheat exports for the same year were valued (according to figures furnished by the Department of Customs) at \$74,293,548. The number of acres under



10 GEORGE V, A. 1920

wheat cultivation in all Canada were 15,109,415 which means that the value of our wheat exported that year was equivalent to \$4.91 per acre. That is, our export of scenery per acre in Rocky Mountains Park was equal to almost three times the acreage value of our exportable wheat surplus.

This does not take into account the money which was kept in Canada by the 24,000 Canadians who took their holidays in the parks in that year and which would add another \$2,000,000 or \$3,000,000 to the total.

It must be remembered, however, that the tourist possibilities of our Canadian parks have not yet been much more than scratched. The revenues derived represent only a small percentage of their possible production, and as I have pointed out before, the sale of scenery never diminishes the capital stock. When we sell a bushel of wheat we sell so much of the constituents of the soil, so many nitrates, so many phosphates, etc., which leaves the soil poorer, but when we dispense scenery we are like the two old people in the Greek fairy tale who entertained Jove and his son. No matter how much we give our guests there is still as much wine left in the pitcher. The dispensers of all other natural commodities are bound in the end, unless they partially replace what they sell, to find themselves in the unfortunate position of Mother Hubbard.

It is scarcely realized how large a sum this loss to the country through the exports of foodstuffs represents. Ferguson Meade, editor of the *Southern Planter*, in an article in the *American Review of Reviews* for April, 1919, is authority for the statement that every time we export a bushel of wheat we export 60 cents' worth of the chemical constituents of the soil which form the food of plants. Now, in 1918, we exported 150,392,937 bushels of wheat and 9,931,148 barrels of wheat flour, which represents another 45½ million bushels, or approximately 196,000,000 in all.

On the above basis this represents a loss to the country of the fertility of the soil in one year of \$117,500,000 for wheat crops alone. The export of other foodstuffs represents a similar loss in varying degrees.

On the other hand, once national scenery is set aside and protected and opened up for public enjoyment, as it is in our national parks, it tends to increase in value, and the more it is used the more valuable it becomes, because tourists who are delighted with their visit not only decide to come again, but they go home and tell their friends and acquaintances to come too, and the tendency each year, as the parks become better known, is for the traffic to keep on growing.

The Parks Service calculations in regard to the revenue potentialities of the parks have a special application to the rapidly developing difficulties in regard to adverse balance of trade, especially as the great bulk of Canada's foreign tourist traffic comes from the United States. It will be remembered that during the past three years, in order to restore our balance of trade with the United States, it has been necessary to establish credits there by means of loans. With this in view, Sir Thomas White, in 1915, floated a loan for \$45,000,000 in New York, and in 1916 a similar loan was floated for \$75,000,000, or an average of \$60,000,000 for the two years. Now, it is quite clear that the same end could be gained by increasing tourist traffic to Canada from the United States. If we could attract \$60,000,000 worth of tourist traffic to Canada from the United States each year, and this should not be difficult when it is remembered that the tourist traffic of Maine is valued at \$40,000,000 we could wipe out our unfavourable balance of trade.

There is another matter in regard to which tourist traffic is of special significance to the Dominion:

The annual interest due on the loans floated by the Government for war purposes is \$72,500,000. This seems an enormous sum, but it is less than half the sum derived in one year by Switzerland from tourist traffic in pre-war days. Canada's mountain area is roughly estimated at 200,000 square miles. The area of Switzerland is only about 15,000 square miles.



## SESSIONAL PAPER No. 25

The possibilities of Canada's mountains and in addition of Canada's recreational areas elsewhere have forced the Parks Service to the conclusion that all its work must be developed primarily with the view to promoting tourist traffic because it appears to offer a very effective means of helping meet the country's financial conditions.

## VISITORS TO ROCKY MOUNTAINS PARK.

The number of Canadian and foreign visitors registered at the Rocky Mountains Park during the past seven years, are as follows:—

Season.	Canadian.	Foreign.	Total.
1911-12... ..	30,000	43,725	73,725
1912-13... ..	45,709	30,173	75,882
1913-14... ..	32,881	15,016	47,897
1915-16... ..	24,503	65,504	90,007
1916-17... ..	36,978	20,272	57,250
1917-18... ..	46,033	21,746	67,779
	<u>216,104</u>	<u>196,436</u>	<u>412,540</u>

Estimated on a basis of \$250 expenditure for each foreign tourist and \$100 for each Canadian this means that the Canadian parks attracted over \$49,000,000 of foreign money in these seven years and \$21,000,000 Canadian or a total revenue of \$70,000,000. The total appropriations for parks in this period were about \$2,500,000. This represents a return of over twenty-seven times the capital invested.

The figures and calculations recited above are given for the purpose of directing attention to the financial potentialities of an active policy of development in regard to National Parks and general tourist traffic. Canada naturally looks to the United States for the bulk of its foreign tourist traffic.

Last it should be imagined that Canada has no competition in this tourist business attention is called to the very active campaign carried on in the United States—"The See America First" movement—for the purpose of keeping the American tourist in the United States.

*Printers' Ink*, New York, March 27, 1919, a publication devoted to the advertising interests is authority for the statement that an advertising appropriation said to be in the neighbourhood of \$800,000 has been decided upon by the Railroad Administration for the purpose of increasing tourist travel during the coming season. Gerret Fort, Assistant Director, in an interview with *Printers' Ink* with regard to the above said it was intended to devote approximately one-half of the above sum to the encouragement of tourist traffic to the American National Parks and the Pacific Coast.

## MOTOR TRAVEL.

The most gratifying feature with regard to tourist traffic to the parks during the past year has been the marked increase in travel by motor. In the parks which can be reached only by railway there was a noticeable decrease in the number of visitors, but the three parks accessible by motor road had a most successful season. Buffalo and Waterton Lakes Parks showed an increase of almost one hundred per cent, while Banff, which was expected to suffer from the falling off of railway travel, owing to the large number of motorists from the prairies, had a very satisfactory season. While a large percentage of cars came from Calgary, there was also a considerable number from Edmonton, Regina and adjacent towns, as well as from Winnipeg and from Montana.

This shows how wide is the field from which motor travel to the parks may be drawn, and indicates the enormous possibilities involved in this form of traffic. A large increase in motor travel from year to year can confidently be looked for, and it



10 GEORGE V, A. 1920

follows that additional attention will have to be paid to the construction and maintenance of high class roads and to provision for the accommodation of this class of visitor.

The development in motor travel from the prairies has one most gratifying aspect and that is it indicates that the wonderful natural parks of the Rockies are now within reach of the people of the prairie provinces. In the past it has been a matter of regret that situated as they were, the parks could not serve all the people of Canada. With the coming of good roads and the low priced automobile, they are within easy reach of practically half of the country. They seem destined to become the future playground for a large part of the west.

#### WILD LIFE IN THE PARKS.

The great abundance of all forms of wild life in the parks is very satisfactory. It shows that sanctuaries properly and fearlessly administered will inevitably result not only in the preservation but in the very large increase of all species of wild life. In the parks to-day the visitor does not need to be told that wild life is abundant. He meets with evidence of the fact wherever he goes.

The Bighorn sheep has now become so plentiful that sometimes between two and three hundred are seen in one flock. A motorist along the motor highway west of Banff counted over 350 in one week-end last April. They have also become so tame that cars sometimes have to slow up to let the sheep off the road. The deer, black bear, goat, elk, beaver and game birds such as ptarmigan, grouse, ducks, geese and swans are also increasing rapidly. The acting superintendent of Waterton Lakes Park reports that elk are making their appearance in that district and that moose tracks have also been observed.

There seems no doubt that wild life has discovered for itself that the parks are sanctuaries. Wardens who patrol the outlying districts report that as soon as the hunting season arrives all the wild life they meet is invariably headed in the direction of the park. Ducks and geese sometimes stay several weeks during migrations and one of the wardens in Jasper reports that they are evidently going to make a breeding ground of the marshes in that park.

Despite the great area of the parks, there is very little poaching. This is probably due to the very stringent way in which the regulations have been enforced, but it also indicates that the public soon become educated as to the sanctity of the parks from a wild life standpoint. There is good evidence to show that even the Indians have now become educated with respect to park boundaries, and very few attempted infractions of the regulations have occurred.

We have been very fortunate in developing a game warden service which possesses an enthusiastic love for wild life and the success of the game protection policy is undoubtedly due to their fearless and relentless enforcement of the regulations, as well as to their active pursuit of predatory animals, such as coyotes.

#### BUFFALO.

The buffalo herds in Buffalo and Elk Island parks continue to thrive and to increase in a most satisfactory manner. There are now about 3,800 in the total herd, and I am advised by the superintendent that the number will have reached 4,000 by the fall. This is an increase of 3,300 in ten years, or almost 500 per cent. The herd is now so large that it seems advisable to consider making some disposal of the surplus males and it is probable that the question of placing a certain number on the market for meat purposes will be considered in the near future.

The cross-breeding experiments being carried on by the director of Experimental Farms at Buffalo Park are producing most interesting results, an account of which will no doubt be published by the Department of Agriculture in due time.



## SESSIONAL PAPER No. 25

## DESTRUCTION OF NOXIOUS ANIMALS.

In Buffalo Park during the past few years coyotes have become a serious menace. They have not only been attacking the bird and animal life in the park itself but were using the park for sanctuary purposes after committing depredations on adjacent farms and settlements. Last year it was decided to make use of trained hounds for the purpose of extermination and about 65 coyotes were destroyed, or nearly three times as many as had been secured by traps during the previous year. This method was therefore continued during the present year and 81 coyotes were killed by the hounds. A gratifying feature is, that of this number, 61 were females. The marked superiority of this method is shown by the fact that only two coyotes were captured in traps during the same period.

In connection with the buffalo herd at Elk Island Park, it is interesting to note that these animals, which were originally of the same stock as those in Buffalo Park are developing under the different environment noticeably different characteristics both structurally and as regards colouration. A veterinary inspector of the Health of Animal Branch reports that their heads are finer and the fore and hind quarters better developed. The skins are also much darker, the long hair on the fore part of the body being black and lustrous. This would seem to indicate that the environment at Elk Island, which affords plenty of shade and possibly more nutritious herbage than that found on the plains, or at Wainwright, is producing a type similar to the wood bison of the far north, whose habitat lies among thick forests. (This may have some bearing if a policy of the commercial disposal of the buffalo is developed.)

## PUBLICITY.

Owing to the reduced appropriation the publication of new literature with regard to the National Parks has not been possible. The manuscript for several publications with regard to the fossils, butter flies, moths and other features of the parks have been prepared and are only waiting for the necessary appropriation. It is hoped that their publication will be possible next year as the editions of practically all literature in stock are now almost exhausted.

The most valuable publicity given the parks during the year was that secured through co-operation with the Exhibits and Publicity Branch of the Department of Trade and Commerce, which featured the national parks in its motion pictures and lecture programme. A number of very fine films of the parks were secured by them and sent out through exchanges practically all over the country. These will also appear in the United States and England, France and other European countries as well as in Australia and New Zealand.

The coloured slides, of which the parks' branch now owns a large collection, were almost constantly in demand and a large number of loans were made to church and other organizations. A set of coloured slides was also sent to Dr. McPhail for the use of the Khaki University overseas.

A large number of photographs have been sent out to magazine writers and others and articles and material prepared for the press.

## NORTHWEST GAME ACT.

Regulations under the new Act concerning game in the Northwest Territories were passed in May, 1918, and since that time the Mounted Police have been fully instructed in the new law and are enforcing it with gratifying results. The detailed and valuable reports concerning wild life conditions in the Northwest Territories which are received from the Mounted Police are most valuable and officers and men cannot be too highly commended for the attention paid to this matter.



10 GEORGE V, A. 1920

The new regulations and Act provide a modern system of protection for the valuable fur and game resources. Foreigners are prevented from exploiting the north, by a graded license system which serves the purpose of a deterrent to irresponsible parties and at the same time informs the police, who issue the licenses, of the presence and location of all hunters and trappers.

The license fees are merely nominal for bona fide residents of the Territories and no license is required by native-born Indians, Eskimos or resident half-breeds.

Hunting or trapping on Victoria island is forbidden to license holders.

A system of returns showing number of game or fur-bearing animals taken under each license is provided for and it is hoped that these returns will furnish a valuable guide to the status of the important species in any year.

A small revenue is derived from the license fees, and in the fiscal year 1918-19 the returns, incomplete as yet, amounted to \$1,202.

During the fiscal year 1918-19, \$3,980 was paid in wolf bounties. This amount will doubtless be increased by later returns from the Royal Northwest Mounted Police.

#### MIGRATORY BIRDS' CONVENTION ACT.

On April 23, 1918, regulations under the Migratory Birds' Convention Act were passed and the Act became operative. From this time steps were taken to acquaint the public with the provisions of the Act, as they applied to the various provinces in Canada.

Work was carried on through the summer by Dr. R. M. Anderson, of the Geological Survey, in the investigation of suggested sanctuaries through the western provinces. This proved a large undertaking and further work may be required before deciding on the most suitable ones for this purpose.

Point Pelee was created a Dominion Park on May 29, 1918. As Point Pelee is a noted resting place for many species of birds during migration, it will prove a valuable bird sanctuary. Many southern forms of bird and plant life occur in this locality which are not found elsewhere in Canada.

Towards the end of 1918 an ornithologist was appointed to assist in the administration of the Migratory Birds' Convention Act and the Northwest Game Act.

A comprehensive publicity campaign has been organized; pamphlets have been prepared and distributed to the press, schools and generally throughout Canada; lectures with motion pictures and coloured lantern slides have been prepared for outsiders, or given by members of the staff. A very successful series of lectures was delivered at the Central Canada Exhibition during the fall of 1918.

The response to our campaign has been excellent. The press have reprinted the published pamphlets very generally in all parts of Canada, and the printing of these articles has served as an impetus to correspondence from the public to the press concerning bird protection.

It was found necessary early in the year to organize a Federal warden service to enforce the Act in the Maritime Provinces. Due publicity was given to the inauguration of this service in the press, and in addition the public was warned by posters that the Federal bird law would be enforced.

In Quebec three bird sanctuaries have been created by the provincial and Dominion Governments, viz.: Bonaventure Island, Percé Rock, and the Great Bird Rocks. These will afford protection to the gannets and other sea birds while they are nesting.

Permits to collect birds for scientific purposes were issued to fifteen ornithologists during the year 1918. The number of permits will be greater during 1919, because the publicity campaign has reached many collectors who did not apply for permits during the first year the regulations were in force.



## SESSIONAL PAPER No. 25

## WILD LIFE CONVENTION.

In February, 1919, an important conference on Wild Life Protection, the first of its kind in Canada, was held under the auspices of the Commission of Conservation and the Advisory Board on Wild Life Protection.

Many important points were discussed and the foundation was laid for better co-operation and understanding between the provinces and between the provincial and Dominion Governments. Several prominent wild life conservationists from the United States addressed the meetings and their presence indicated the spirit of co-operation which was developing between the United States and Canada in wild life protection.

## ANTELOPE.

The antelope herd at Foremost, Saskatchewan, is thriving and shows a most satisfactory increase. This is by all odds the most successful effort yet made in Canada to breed antelope in captivity. About three years ago fifty antelope were enclosed and the last count shows about seventy-five.

It is believed that the thriving condition of the herd is due to the fact that the reserve contains all the medicinal plants and mineral deposits required to keep the animals in a healthy condition. Probably these plants and minerals were absent from Buffalo Park and the other reserves where attempts to breed antelope proved unsuccessful.

## AGREEMENT WITH BRITISH COLUMBIA.

An important agreement was made during the year between the province of British Columbia and the Dominion. By it the province granted to the Dominion for parks purposes a strip of land ten miles wide, extending from Sinclair Creek in the Columbia Valley eastward to the Alberta boundary, an area of approximately 350,000 acres.

The Province also agreed to a satisfactory adjustment of the many outstanding conflicts of jurisdiction within Dominion Parks in British Columbia. In return the Dominion undertook to complete the construction of the Banff-Windermere auto road, which when finished will provide one of the most spectacular auto roads on the continent. The agreement is published in detail as an appendix to this report.

## AGREEMENT WITH ALBERTA.

For some years there have been conflicts of jurisdiction as between the Province of Alberta and the Dominion in regard to parks situated in Alberta. An agreement with Alberta was executed satisfactorily adjusting these conflicts. The agreement is printed as Appendix 12 of this report.



## APPENDIX No. 1.

REPORT OF THE SUPERINTENDENT OF ROCKY MOUNTAINS PARK,  
J. M. WARDLE.

Two or three years ago the prospects of a successful season for the Rocky Mountains Park in the fifth summer of the world-wide war would have been hopelessly discounted. Nevertheless the season of 1918 was far from being an unsuccessful one, and the number of visitors to the most developed of our National Parks speaks well for its attractiveness and popularity. While war's continued demands and conditions prevented many visitors from travelling, the undoubted need for recreation in trying times led many people to the Rocky Mountains Park to rest and gain new life and vigour from her quiet valleys and inspiring peaks.

## MOTOR TRAVEL.

The last two years have more than vindicated the decision of the Department to allow automobiles within the park. War conditions, coupled with restrictions on travel by rail and greatly increased passenger rates, brought the number of visitors travelling by rail to a minimum. The number of motorists, however, showed a further increase over last year, and the success of the past season is due entirely to this class of visitor. Without the motor cars, the season, particularly for Banff, might have proved disastrous. As it was, during the summer months the town was continually filled with motoring visitors from all parts of the Prairie Provinces and accommodation was frequently overtaxed. While a large percentage of visiting cars came from Calgary, cars were also noticed from Edmonton, Regina, and adjacent towns—from Winnipeg and from Montana, Minnesota and other states.

The indications are unmistakable that in the future the motorists will comprise the majority of our park visitors. The close of the war will, it is hoped, soon increase the travel by rail to the heights reached in pre-war days, but there will doubtless be a corresponding increase in motor traffic.

During the past year the roads in the park were generally in good condition. Exceptionally dry weather in the early summer resulted in the light materials in the roads west of Banff being badly cut up in sections, but a few days' rain in August assisted in getting these roads into good shape again.

The weather throughout the season was remarkably fine. For some reason motorists show a disinclination to visit the mountains in September or October. These months are, as a rule, the finest of the year in the Rocky Mountains Park. All winged pests are gone, roads are good, the autumn colouring is beautiful, and the crisp pure air combines to give a freshness and enjoyment to motoring only possible in the autumn months.

Rocky Mountains Park suffered comparatively little in the summer freshet of 1918. Bright sunshine in the early spring melted gradually the snows in the tributary valleys of the Bow that usually cause most damage to our roads and bridges. The Bow river itself reached a high stage in the middle of June, causing trouble along the railway lines both east and west of Banff.

Following the war policy laid down for the different departments, no new work was opened up during the year. Necessary maintenance work was undertaken, and considerable improvement was made in the eastern extremity of the motor road between Banff and Kananaskis. This latter work was considerably curtailed through lack of labour, and on that account, although continued nearly a month later than usual, to December 1, was not completed.



## SESSIONAL PAPER No. 25

## AUTOMOBILES.

It is pleasing to note that another increase in motor traffic over previous years was experienced. During the week ends the officials registering the automobiles at the Entrance Arch were very often taxed to keep their work running smoothly and the cars recorded and passed in without undue delay.

During the year the following automobile licenses were issued:—

Private cars.. . . . .	103
Livery cars.. . . . .	60
Transient cars.. . . . .	2,231
<b>Total.. . . . .</b>	<b>2,394</b>

## BANFF TOWNSITE.

The work undertaken by the department in the Banff townsite chiefly consisted in keeping in repair the various streets, and the water and sewer services in the town. The surface of Banff avenue was repaired in the fall, and one or two other streets were surfaced with gravel.

## CAMP SITE.

The camping grounds, reserved along the Spray river and Golf Links road, were again well patronized. Every week end saw motor cars from various parts of the prairie provinces, laden with camping equipment, en route to the camp site.

Frequent visits by the sanitary inspector and the regular collection of garbage and rubbish kept the camp site clean and attractive in appearance. During the year 57 camping permits were issued, and as there were from three to five persons in the average camping party it is estimated that there was a total of some 230 campers during the season. Several parties stayed for over a month and others remained in camp until the end of October.

## FIRE BRIGADE.

The Banff volunteer fire brigade responded to nine calls. All of these were for fires in frame buildings, only one being in the first class fire district. Through the promptness and efficiency of the brigade and with the aid of up-to-date equipment furnished by the department, none of the fires proved serious. The total loss through fires is estimated at \$2,800.

## ANIMAL ENCLOSURES AND ZOO.

Owing to a large increase in the elk, we were able to turn out 41 of these animals early in the summer to shift for themselves. This was done with some difficulty, as the elk showed a disinclination to leave their quarters. Those turned out were seen occasionally during the summer north of Bankhead and in the vicinity of lake Minnewanka, and during the fall several attempted to break through the fence back into the enclosure.

The dryness of the early summer months resulted in a shortage of pasture in the smaller enclosures and necessitated the enlargement of the goat pasture.

A shelter for the yak was erected in their enclosure in the fall. This building is of suitable design and has sufficient accommodation for some forty or fifty yak.

## GOVERNMENT BATHS.

During the summer months the Cave and Basin is one of the most popular resorts in Banff, as is shown by the patronage of a very high percentage of the total number of visitors to the park.



10 GEORGE V, A. 1920

A large percentage of the visitors to the Upper Hot Springs take the baths for their curative properties, and the total number of visitors for the past year was very gratifying.

## VISITORS.

Among the early visitors to Banff and the park were the International Fishery Commission, headed by Mr. W. A. Found. The commission spent one day in Banff, in May, and were extended the courtesies of the park.

Major-General Sir Louis Jackson visited Banff towards the end of June and expressed himself delighted with the different drives and various points of interest.

In September Baron Shaughnessy spent two days in Banff, being a patron of the Golf Links during his visit.

In October, Prince Fushimi of Japan, who represented Japan in several international conferences, with his staff spent half a day in Banff, and was an interested visitor to the museum, zoo, and buffalo paddock.

Early in August, Banff was honoured by an informal visit from Prince Arthur of Connaught. Escort was provided for him by the Royal Northwest Mounted Police, some additional men being brought up from Calgary to augment the local detachment.

Prince Arthur visited all the points of interest in Banff and the vicinity, and also played several rounds on the golf links.

Sixty-eight grazing permits were issued during the year and covered the grazing of 138 horses and 212 cows.

## CANMORE.

A much needed protection to the Canmore townsite from the Bow river was afforded by the construction of a timber river-wall, backfilled with rock, along the north bank of the Bow adjacent to the townsite. The former row of piles protecting the river bank at this point was badly weakened through decay and had given away at several points.

The main street of Canmore was improved during the summer by removing the stones and boulders.

## LAKE LOUISE.

The great advantage of being connected to outer points by motor roads was emphasized by the quiet season at Lake Louise as compared with that at Banff. The former is entirely dependent for a successful season, on tourists travelling by rail, and various war conditions and restrictions combined to reduce the number of visitors to this attractive spot.

The Moraine Lake drive was again deservedly popular, a regular automobile service to the lake being operated by a transport company.

During the busy season a camp was maintained at the lake for the benefit of tourists and others wishing to spend a few days there, or to make it their headquarters for fishing and other trips.

During the season a new tea house was opened on the summit of the big "Beehive Mountain," at an altitude of 7,430 feet. This is one of the highest refreshment stands in America, being 550 feet above the tea room at lake Agnes. The east windows overlook a sheer drop of 780 feet to Mirror lake, while the southern exposure overlooks a greater though less precipitous drop of 1,760 feet to lake Louise. The "Beehive" tea room is reached by a continuation of the trail to lake Agnes.

## HEALTH.

In common with other points of the American continent, the Rocky Mountains park was visited in the fall and winter of 1918-19 by the world-wide epidemic of influ-



## SESSIONAL PAPER No. 25

enza. Fortunately the clear dry air and the healthy surroundings combined to greatly reduce the severity of the attacks. The mortality was also considerably below the average percentage for the rest of the country. From the figures obtained from the medical officer for the park, the mortality was only 3·3 per hundred cases.

**MOUNTED POLICE.**

During the greater part of 1917, civil and criminal law in the park has been administered by the provincial authorities. The past year saw the re-establishment of the Royal Northwest Mounted Police in the park, for the maintenance of order and the enforcing of the various park regulations. The Banff detachment assumed their duties early in June.

## APPENDIX 1a.

NATIONALITIES OF VISITORS TO ROCKY MOUNTAINS PARK FROM  
APRIL 1, 1918, TO MARCH 31, 1919.

VISITORS REGISTERED AT THE CAVE  
AND BASIN.

Canada.. . . . .	11,964
United States.. . . . .	5,091
England.. . . . .	192
Scotland.. . . . .	158
Ireland.. . . . .	42
Wales.. . . . .	13
Australia.. . . . .	319
New Zealand.. . . . .	149
Tasmania.. . . . .	28
India.. . . . .	34
Holland.. . . . .	4
France.. . . . .	18
China.. . . . .	13
Malay States.. . . . .	5
Straits Settlements.. . . . .	21
Phillipine Islands.. . . . .	7
South Africa.. . . . .	3
British West Indies.. . . . .	11
Portugal.. . . . .	4
Japan.. . . . .	37
Korea.. . . . .	15
South Sea Islands.. . . . .	5
Hawaian.. . . . .	5

**Total.. . . . . 18,138**

Paying bathers.. . . .	31,662
Bathers with passes.. . . .	576

NUMBER OF BATHERS AT UPPER HOT  
SPRINGS, April 1, 1918, to March 31, 1919.

Canada.. . . .	24,346
United States.. . . .	240
England.. . . .	56
Scotland.. . . .	26
Ireland.. . . .	10
Italy.. . . .	8
Australia.. . . .	12

Total.. .. 24,698

Total number of bathers at Cave and Basin and Upper Hot Springs, 56,936.

GUESTS VISITING BANFF SPRINGS  
HOTEL, Season 1919, May 15 to September  
30.

Canada.

Alberta.. . . . .	2,462
British Columbia.. . . . .	302
Manitoba.. . . . .	658
New Brunswick.. . . . .	11
Nova Scotia.. . . . .	15
Ontario.. . . . .	586
Quebec.. . . . .	210
Saskatchewan.. . . . .	290
Prince Edward Island .. . . . .	2

## United States.

Alabama.. . . . .	2
Arizona.. . . . .	1
Arkansas.. . . . .	1
California.. . . . .	234
Connecticut.. . . . .	19
Colorado.. . . . .	2
Delaware.. . . . .	1
District of Columbia.. . . . .	33
Florida.. . . . .	2
Georgia.. . . . .	12
Illinois.. . . . .	252
Idaho.. . . . .	3
Indiana.. . . . .	26
Iowa.. . . . .	33
Kansas.. . . . .	19
Kentucky.. . . . .	2
Louisiana.. . . . .	9
Maine.. . . . .	13
Minnesota.. . . . .	114
Mississippi.. . . . .	6
Missouri.. . . . .	81
Montana.. . . . .	31
Massachusetts.. . . . .	105
Maryland.. . . . .	23
Michigan.. . . . .	66
New York.. . . . .	421
New Jersey.. . . . .	37
New Hampshire.. . . . .	4
North Carolina.. . . . .	3
Nevada.. . . . .	4
North Dakota.. . . . .	10
Nebraska.. . . . .	18
New Mexico.. . . . .	3
Ohio.. . . . .	91
Oklahoma.. . . . .	18



## DEPARTMENT OF THE INTERIOR

10 GEORGE V, A. 1920

GUESTS VISITING BANFF SPRINGS HOTEL, Season 1919, May 15 to September 30—*Continued.*

*United States—Concluded.*

Oregon.. . . . .	27
Pennsylvania.. . . . .	123
Rhode Island.. . . . .	20
South Carolina.. . . . .	2
South Dakota.. . . . .	1
Texas.. . . . .	13
Tennessee.. . . . .	7
Utah.. . . . .	1
Virginia.. . . . .	2
Vermont.. . . . .	17
Washington.. . . . .	85
Wisconsin.. . . . .	45
West Virginia.. . . . .	2
Wyoming.. . . . .	

## Foreign countries

Alaska..	10
Australia..	142
Africa..	1
Borneo..	3
British Guiana..	3
Burma..	3
China..	23
Ceylon..	3
Egypt..	1
England..	60
France..	4
Fiji Islands..	2
Hawaii..	7
Honolulu..	18
India..	1
Japan..	24
Jamaica..	2
Java..	1
Manila..	1
Mexico..	1
Malay Straits..	2
New Zealand..	14
Newfoundland..	4
Portugal..	3
Roumania..	1
Scotland..	6
Siam..	2
Sweden..	12
Switzerland..	1
Tasmania..	1
Total	6,939

STATEMENT OF PERSONS REGISTERED  
AT CHATEAU LAKE LOUISE, LAKE  
LOUISE, ALTA.—Season 1918.

	1918.	1917.
Manitoba.. . . . .	17	39
(Winnipeg).. . . . .	205	203
Saskatchewan.. . . . .	169	319
Alberta.. . . . .	471	721
British Columbia.. . . . .	149	158
Total.. . . . .	1,011	1,440
Decrease.. . . . .	429	

	1918	1917.
Prince Edward Island.. . . .	1	3
Newfoundland.. . . .	2	....
Nova Scotia.. . . .	6	17
New Brunswick.. . . .	15	23
Quebec.. . . .	110	122
Ontario.. . . .	340	417
	<hr/>	<hr/>
Total.. . . .	474	582
	<hr/>	<hr/>
Decrease.. . . .	108	

Maine.. . . .	5	22
New Hampshire.. . . .	10	4
Vermont.. . . .	4	19
Massachusetts.. . . .	51	181
(Boston).. . . .	74	192
Connecticut.. . . .	29	87
Rhode Island.. . . .	14	42
New York State.. . . .	91	235
(New York City).. . . .	336	908
Pennsylvania.. . . .	50	92
(Pittsburg).. . . .	37	91
(Philadelphia).. . . .	82	202
New Jersey.. . . .	68	183
Delaware.. . . .	10	4
Maryland.. . . .	22	34
District of Columbia.. . . .	34	51
West Virginia.. . . .	7	23
Virginia.. . . .	5	25
Total.. . . .	959	2,393
Decrease.. . . .	1,434	

Kentucky.. . . . .	6	36
Tennessee.. . . . .	9	34
North Carolina . . . . .	2	10
South Carolina . . . . .	4	2
Georgia.. . . . .	12	33
Alabama.. . . . .	.. . . .	27
Mississippi.. . . . .	2	7
Louisiana.. . . . .	18	35
Florida.. . . . .	4	10
	<hr/>	<hr/>
Total.. . . . .	57	194
	<hr/>	<hr/>
Decrease.. . . . .	137	

Ohio. . . . .	76	260
(Cleveland). . . . .	35	75
(Cincinnati). . . . .	16	63
Michigan. . . . .	114	51
(Detroit). . . . .	73	45
Indiana. . . . .	40	62
(Indianapolis). . . . .	15	32
Illinois. . . . .	53	223
Chicago. . . . .	202	623
Iowa. . . . .	61	181
Total. . . . .	685	1,646
Decrease. . . . .	961	



## SESSIONAL PAPER No. 25

STATEMENT OF PERSONS REGISTERED  
AT CHATEAU LAKE LOUISE, LAKE  
LOUISE, ALTA.—Season 1918—*Con.*

	1918.	1917.
Missouri . . . . .	20	42
(St. Louis) . . . . .	50	88
(Kansas City) . . . . .	24	75
Kansas . . . . .	17	40
Arkansas . . . . .	3	11
Oklahoma . . . . .	20	39
Nebraska . . . . .	15	49
(Omaha) . . . . .	12	38
Texas . . . . .	4	79
Total . . . . .	165	461
Decrease . . . . .	296	

Wisconsin . . . . .	49	96
(Milwaukee) . . . . .	22	60
Minnesota . . . . .	23	50
(Minneapolis) . . . . .	91	222
(St. Paul) . . . . .	34	54
North Dakota . . . . .	9	43
South Dakota . . . . .	9	10
Total . . . . .	237	535
Decrease . . . . .	298	

Washington . . . . .	183	208
Oregon . . . . .	65	123
California . . . . .	103	466
(San Francisco) . . . . .	107	276
(Los Angeles) . . . . .	60	243
Nevada . . . . .	6	8
Total . . . . .	524	1,324
Decrease . . . . .	800	

Montana . . . . .	12	6
Idaho . . . . .	1	10
Wyoming . . . . .		1
Colorado . . . . .	2	16
Utah . . . . .	2	
Arizona . . . . .		6
Total . . . . .	17	49
Decrease . . . . .	32	

West Indies . . . . .	4	5
Mexico and Central America . . . . .	1	1
South America . . . . .	4	4
Total . . . . .	9	10
Decrease . . . . .	1	

England . . . . .	40	34
Ireland . . . . .		2
Scotland . . . . .	3	3
France . . . . .	1	2
Holland . . . . .		65
Other European countries . . . . .	12	14
Total . . . . .	56	120
Decrease . . . . .	64	

STATEMENT OF PERSONS REGISTERED  
AT CHATEAU LAKE LOUISE, LAKE  
LOUISE, ALTA.—Season 1918—*Con.*

	1918.	1917.
Australia . . . . .	90	66
New Zealand . . . . .	20	50
China . . . . .	41	60
India . . . . .	14	11
Hawaii . . . . .	15	25
Phillipine Islands . . . . .	2	12
Africa . . . . .	3	7
Japan . . . . .	18	17
Straits Settlements . . . . .	4	10
Total . . . . .	207	268
Decrease . . . . .	61	

CONDUCTED PARTIES (otherwise unal-  
located).

	1918.	1917.
Raymond & Whitcomb . . . . .		10
G. K. & B. . . . .		52
Various . . . . .	13	20
Total . . . . .	13	82
Decrease . . . . .	69	
Unallocated . . . . .	41	61
Total . . . . .	4,454	9,155
Decrease . . . . .	4,701	

## KING EDWARD HOTEL (open all year).

Canada . . . . .	4,594
United States . . . . .	334
England . . . . .	15
Scotland . . . . .	4
Australia . . . . .	82
New Zealand . . . . .	6
India . . . . .	3
France . . . . .	2
Holland . . . . .	4
Norway . . . . .	1
Japan . . . . .	2
China . . . . .	8
Total . . . . .	5,085

HOMESTEAD HOTEL (open May 4 to Sept.  
29).

Canada . . . . .	2,090
United States . . . . .	80
South Africa . . . . .	7
France . . . . .	2
Total . . . . .	2,179

24,420 meals were served at this hotel.



10 GEORGE V, A. 1920

MOUNT ROYAL HOTEL (open May 15 to Oct. 15).		UPPER HOT SPRINGS HOTEL (open all year).	
Canada.. . . .	2,815	Canada.. . . .	620
United States.. . . .	250	United States.. . . .	18
England.. . . .	5	Other countries.. . . .	4
Australia.. . . .	7		
New Zealand.. . . .	2		642
Other countries.. . . .	15		
	3,094		
ALBERTA HOTEL (open April 1 to Nov. 13).		SUMMARY.	
Canada.. . . .	1,900	Banff Springs Hotel.. . . .	6,940
United States.. . . .	20	Chateau Lake Louise.. . . .	4,454
Other countries.. . . .	5	King Edward Hotel.. . . .	5,085
	1,925	Mount Royal Hotel.. . . .	3,094
		Homestead Hotel.. . . .	2,179
		Alberta Hotel.. . . .	1,925
		Upper Hot Springs Hotel.. . . .	642
		Summer cottagers and campers.. . . .	6,000
		Motorists.. . . .	11,500
			41,819

APPENDIX 1b.

REPORT OF THE CURATOR OF BANFF MUSEUM, N. B. SANSON.

Several trips were made for the purpose of exploring and collecting specimens for the museum. Interesting photographs were taken of animal and vegetable life and also of mountain scenery, which are to be placed on exhibition. Collections of insects, spiders, birds, fossils and plants were made in different localities in the park.

A specimen of *Hepialus* (*Hyperhoreus*), very rare, was collected. There are only three of these specimens in the world, one in the United States and one in the collection of Mr. Bowman, of Edmonton.

Some time was spent in searching for *Grylloblatta*, but only one adult and three immature specimens were secured on Sulphur mountain.

BIRDS.

White winged crossbills have been seen about now and again this winter. The red plumage of the male is unusually beautiful.

Clarke's nutcrackers are still less numerous than usual and the Canada jay is seldom seen now about Banff.

Thousands of *Vanessa Californica* (the California tortoise shell) appeared about Banff. This is thought to have been due to the unusually fine weather during the summer.

Wild and cultivated plants were blooming in October last year owing to the exceptionally fine autumn.

GENERAL INFORMATION WITH REGARD TO WEATHER CONDITIONS AT BANFF.

The weather for the year ending March 31, 1919, showed some marked exceptions to all previous records. November and December, 1918, and January 1919, were comparatively mild months. In November the temperatures of zero and below occurred twice. In December temperatures of zero and below occurred five times. In January temperatures of zero and below occurred twice. Part of February and March were



## SESSIONAL PAPER No. 25

cold; in February temperatures of zero and below occurred sixteen times and in March thirteen times. At the end of March there was much more snow on the ground than usual, but sleighing did not start till December 3, continuing until April. The snowfall for this year was about the average, being six feet nine inches to the end of March. The first snowfalls fell on a dry ground before frost had penetrated the ground to any extent. At the end of March there was about four feet of snow near the top of Sulphur mountain, or an average of about two and one-half feet over all the mountain on the level.

The weather of two of the months of the year was specially noticeable. In July, three inches of snow fell, the first reported snow for July since this station was organized.

The following notes with regard to September, a lovely month, may prove of interest:—

Mean temperature 51.8, maximum temperature 78.4, minimum temperature 27.9. There were fifteen temperatures of 70 degrees and over, and only eight temperatures of 32 degrees and lower. Only five days with rain, and no snow, twelve perfect days and seven very fine days. This was the finest September on record.

## APPENDIX No. 1c.

## THE ALPINE CLUB OF CANADA.

*(Report prepared by the Club.)*

The Alpine Club House was open during June, July, August, and September, to members and their friends. In common with other features of the national parks it received less patronage than usual owing to war conditions and the exceedingly high railway rates. However, it served to bring the mountain regions of Canada to the consideration of many who needed information. The officials are always ready to help with such knowledge as they possess, any who come, and realize perhaps most of all how much a local guide is needed in Banff thoroughly conversant with and interested in its many attractions. Hotel clerks who spend their brief season in the mountains in hotel corridors cannot know these things however obliging they may be.

Besides the somewhat interesting ascents of Rundle and Cascade, Mount Norquay was several times climbed and declared the most interesting of the moderately difficult climbs in the neighbourhood. The favourite route started directly from the motor road to Castle mountain.

The Bow river becomes more appreciated every year as the trips along the Spray and through the gap to Canmore and round Sulphur mountain coming down into Sundance valley are better known.

It appears to the authorities of the Alpine Club that steady employment could be found for one or even two competent guides stationed at the village of Banff during the summer months. There are many climbs and expeditions of very great interest in the immediate vicinity and an important percentage of the visitors would be glad to make these if suitable guides were available.

For climbs, Mounts Cascade, Rundle, Norquay, Edith, Louis, Aylmer, Inglismaldie, Peechee and Sulphur may be mentioned. For expeditions there are several round trips such as Edith pass, Mystic lake, Johnston creek and canyon, Spray river trail, Canmore gap and home by railway; Sundance canyon, across Sulphur mountain and home by Spray river road. The foregoing may be mentioned as examples,



10 GEORGE V, A. 1920

but there are a number of others, all of interest, but needing a competent guide. They can readily be accomplished without the expense of a pack train.

Such guides need not necessarily be Swiss guides. Competent Canadian guides can readily be found. They should be in the employ of the Government and their services be made available from the office of the superintendent.

A word about bears: Owing to the park regulations prohibiting the use of firearms and the running of dogs at large, wild life in the park becomes a feature. Deer walk the streets and feed at the kitchen doors. Bear while not familiar, frequent the outskirts of the village and during the past season did considerable damage at the Alpine Club House, twice entering the pantry and carrying off food, and once breaking a large plate glass window in the assembly room. While it is admitted by those who know well that the brown bear is not absolutely dangerous if left severely alone, still it is not possible to convince strangers that such is the case and the ravages of these animals are a constant fear to our guests and employees when walking the less frequented roads and gathering flowers in the woodland surroundings. Apart from that, it seems that the expense of the damage they do, which has been considerable at the club house during the past few years, has to be borne by the club and it is thought that more adequate protection should be given. Come upon suddenly, or with their young, bears cannot be counted upon to run away and there is always the possibility of a tragedy.

In conclusion it would not be amiss to say a few words concerning the winter sports at Banff. For the past three years the residents of Banff with a true sportsman-like spirit have organized and carried out successfully a winter carnival of sports. Through the good management and hard work of those placed in charge the sports have been made to pay expenses and a goodly attendance has been present throughout the period they were in operation. As a rule the weather is ideal and particularly so during the last carnival when bright blue skies, fleecy white clouds and brilliant sunshine made the wonderful surroundings of snow-clad peaks veritable fairyland.

Skating, snowshoeing, ski-ing, curling and hockey on the ice were the order of the day and of the night; and the atmosphere, climate conditions and general feeling of glorious exhilaration induced by the bright warm winter days at this high altitude could not have been surpassed by the most famous winter resorts of the European Alps.

In addition, the swimming contests in the magnificent Government bathing pools, the annual meet of the gun club, the nightly dances and masquerade balls and the moving pictures of winter sports and other subjects supplied continuous attractions; whilst a handsome ice palace brilliantly illuminated at night provided a centre of attraction.

But it needs more than the efforts of the villagers to make the most of the grand opportunities nature has given to Banff in this respect. The mountain parks, and particularly the Rocky Mountains park, are the property of the Canadian people and are for their benefit first of all. It is therefore appropriate that the Canadian Government and the great corporation of the Canadian Pacific railway should lend all possible assistance to make the very best of this grand natural asset. Further, it is for the people of Canada to lend their assistance to such splendid features of the mountains that belong to them by participating in the sports, and it is here the railway corporation can best lend assistance by providing rates of travel that will place such wonderful opportunities within reach of the public.

The Alpine Club from the first has clearly heard the call and has participated to the extent of its ability in collaborating with the residents of Banff. It has in each year had its director there as a representative and a number of members have been present. It has also during the past two years presented a handsome silver cup to be competed for by the ladies hockey teams, and will continue to so participate in the future.



## SESSIONAL PAPER No. 25

The club wishes in this connection to express a note of appreciation for the good work done by the superintendent of the park who is evidently a good sportsman and who seems to realize the great possibilities that are presented by the beginning of winter sports in the Canadian Rockies as a valuable asset of the present and a still greater one for the future.

## APPENDIX No. 1 (d).

REPORT OF THE THIRTEENTH ANNUAL CAMP OF THE ALPINE CLUB  
OF CANADA IN PARADISE VALLEY, 1918.

The thirteenth Annual Camp of the Alpine Club of Canada was held in Paradise valley, on the site of the 1907 camp, from July 15 to July 31. The attendance was smaller than usual owing to war conditions and the high cost of travel.

The situation was a charming one, under the shadow of Mt. Temple, with a fine view of the north wall of Hungabee. At once the visitor realized he was in the heart of the big mountains, the true Rockies of Canada. In connection, an outlying camp was pitched in Consolation valley, a most lovely site.

The weather was truly accommodating. One day a heavy snow storm rendered climbing impossible, but the snow had nearly all disappeared at night. In 1907 Temple and Aberdeen were considered serious climbs. In 1919 they were looked upon as good enough for training, but not the real thing. Mt. Pinnacle and The Mitre were ascended by quite a few parties and one traverse was made up the steep wall from the valley over Ringrose and down to lake O'Hara. Various expeditions were made in the delightful neighbourhood which are well known. One, however, which is new and by no means strenuous, was found to be well worth while. Between Westach pass and Hungabee rises a dome-shaped mountain, slightly under 10,000 feet in altitude, which is easily climbed from the summit of the pass. It is the key to many valleys and commands a superb view.

One of the club members, Mr. V. A. Fynn, made many original variants of familiar climbs from Lake Louise during the season and repaired and equipped at his own expense the hut in the O'Hara meadow. Were the club in a stronger financial position it would do much on such lines to make the mountains more readily available to the people of Canada and other nations.

From the annual meeting a resolution of sympathy and appreciation was sent to the club members on war service, and another of congratulation to its released prisoners.

Two Swiss guides, loaned to the club by the chief of the hotel service of the Canadian Pacific Railway, were in attendance at the camp while in session. Edward Feuz and Christian Hasler have long been friends of the club and its members, and, as always, gave their very best professional services to make the climbing programme a complete success.

There were present members of the English, Swiss and American Alpine Clubs, of the Appalachian Mountain Club and of the Royal Geographical Society.



**APPENDIX No. 2.****REPORT OF THE SUPERINTENDENT OF YOHO PARK, E. N. RUSSELL.**

The past year, in spite of the many disadvantageous conditions due to the war, has been a very satisfactory one. Although appropriations were small, labour scarce, and there was a great deal of work to be done to keep the parks up to the standard of their reputation, it was possible to complete the programme of work for the year as laid out, and while there has been no great progress in the way of new development work, all existing roads, trails, buildings and other works have been adequately kept up and are ready for the thousands of tourists who will no doubt wish to visit the parks now that the war is over.

**WORK OF THE YEAR.**

In addition to the usual spring work in connection with the cleaning up of the townsite of Field, repairing sidewalks and streets, etc., the first work undertaken was the raising and strengthening of the bridge over the Kickinghorse river at Field and the protection work on the creek at the back of the townsite.

The Kickinghorse bridge, a structure about 300 feet in length, was raised about 2 feet for its entire length. This had been rendered necessary by the filling in of the bed of the river, which at this point had recently been built up about 18 inches by deposits of sediment and gravel. The piers were then built up and the two main trusses strengthened. A small spur rock dam was also constructed above the bridge for the purpose of throwing the water over into the main channel again and thus assisting in cutting out the material deposited there.

The protection work on the creek consisted of the building of a log, rock-filled crib, 250 feet in length along the bank of the creek, the throwing up of a gravel embankment for about the same distance and the strengthening of the bank at other points. This work was necessary to protect the townsite from the danger of the creek overflowing its banks. Later on in the season a small truss bridge, 40 feet in length, was erected over the creek on the road from the town to the cemetery.

**ROADS.**

The repair and maintenance work necessary in connection with roads was not so heavy as usual, due largely to the decreased traffic. The Yoho road required the most attention, about 35 feet of road bed at one spot in the canyon having been completely carried away. Considerable trouble was also experienced about a mile from Field by the flooding of the Kickinghorse river. The latter piece of road was eliminated later in the season by building a diversion along the side hill on higher ground.

Minor repairs were effected on several of the other roads, but only those of an urgent nature were undertaken, as labour was very scarce. For this reason it was found impossible to place sectionmen on the Emerald Lake road as usual and only on the Yoho road for a very short period.

**TRAILS.**

On the Leachoil trail two new diversions were built in order to avoid the low lying ground in the Kickinghorse valley in which we have experienced considerable trouble on account of high water.



## SESSIONAL PAPER No. 25

On the Ottertail trail we were unfortunate in losing two bridges over Ottertail creek which were carried away by the high water. Both of these, however, had served their time being over 20 years old. Instead of replacing both these bridges it was decided it would be better to construct a trail up the west bank of the river to the site of the upper crossing and thus eliminate the lower bridge, it having been found impracticable to build the trail along the east bank for the entire distance. This scheme was later satisfactorily carried out.

## TELEPHONE LINES.

No new lines were built but the whole of the Field-Ottertail line was taken down and re-strung so as to conform with the regulations of the Canadian Pacific Railway Company on whose poles the line is hung. This also had to be done on the greater portion of the Leanehoil-Deer Lodge line, the company's regulations calling for all solid insulators, in place of the split tree insulators which we use.

## FIRE AND GAME PROTECTION.

Valuable work was done by the warden service throughout the season. Over 166 miles of trails were cleaned out, maintained and patrolled in addition to their other duties. No fires of any consequence occurred although the weather for part of the season was very dry and the fire hazard great. The systematic campaign inaugurated by the branch for the purpose of educating the public as to the danger of carelessness with regard to fire in the forest was energetically carried on with all the means at our disposal. The results of this campaign are easily discernible in a more careful use of fire in all its forms on the part of the public frequenting the park.

## FISHING.

About 2,000 ouananiche or land-locked salmon fry, were placed in Sherbrooke lake during the season. This lake was chosen for their experimental planting because the Department of the Naval Service particularly desired that a body of water should be selected which was not readily accessible from any hotel or to tourists, and this lake was considered in all respects most suitable.

## TOURIST TRAVEL.

As was to be expected tourist travel was unusually small. Now that brighter days are coming, however, it is hoped that the traffic will soon exceed that of the pre-war days and that everything possible will be done to promote what is now recognized to be one of the important revenue producing resources of the Dominion. Probably nothing would tend more to the development of Yoho park than the completion of the main highway, now under construction, between Banff and Field. This would throw open all the beautiful drives in the park to the people of the Prairie Provinces by a direct motor road, and would no doubt result in Field becoming a most popular week-end resort.

## HOTELS.

Since the last report the Canadian Pacific Railway Company have turned over the Mount Stephen House at Field to the railway organization of the Y.M.C.A. It is understood, however, that the company intend to erect a more modern hotel at a site to be determined on, which will be farther from the railway line than the present building. In the meantime, it is understood rooms and meals will be available for the tourist in the old building under the management of the Y.M.C.A.



10 GEORGE V, A. 1920

**APPENDIX No. 3.****REPORT OF THE SUPERINTENDENT OF GLACIER PARK, E. N. RUSSELL.**

As is usual in this park, it was not until the month of June that a start could be made on the general work of the season. The snowfall for the winter 1917-18 was exceptionally heavy, our warden at Glacier recording a total of over 50 feet. As practically no melting takes place, such a heavy fall naturally requires a long time to melt and high water is generally upon us before the snow is all gone. As is to be expected there are always numerous snow slides which bring down large quantities of rock and débris which do considerable damage to the roads, trails and bridges.

As soon as the snow was sufficiently melted, an attempt was made to renew the bridges over Beaver river and Grizzly creek, on the Beaver River trail, but the work had to be abandoned for the time being, owing to a sudden rise in the water. The men were therefore moved over to Glacier and the repairs necessary on the road to the Nakimu caves were carried out.

The trails were for the most part cleared out by the wardens except in the case of the Baloo pass and Glacier trails, on which extra assistance was required.

Work on the Beaver River trail was resumed in September, after the flood waters had subsided, and the services of some exceptionally good men were secured, including three of the celebrated Swiss guides. The Bear Creek bridge which had been undermined at one end, was first raised and generally repaired, and then the construction of a new bridge over Beaver river was proceeded with. As the main span on this crossing was over 90 feet in length, the cantilever type of bridge was used and an excellent job made of the whole structure. All bridges in this country have of course to be able to stand enormous strains in order to bear the weight of the winter snows, but this bridge, as constructed, should be able to stand all that will be demanded of it. Its total length is 144 feet.

At the Nakimu caves a considerable amount of development work was done by the caretaker and discoverer, Mr. C. H. Deutschman. Although unable to secure the services of an efficient helper, Mr. Deutschman started in on the work single-handed, and made such progress that by the end of the season he had completed 111 feet of concrete stairway and 67 feet of concrete walk, as well as a number of smaller works, all of which will tend to make the caves more accessible to the public.

Only a few minor fires occurred during the year and these were easily suppressed and no damage to either timber or property resulted.

**APPENDIX No. 4.****REPORT OF THE SUPERINTENDENT OF REVELSTOKE PARK.  
E. N. RUSSELL, ACTING SUPERINTENDENT.**

The appropriation allotted to Revelstoke park was materially reduced this year and was only sufficient to cover safeguarding the park from forest fires and the actual repairs and maintenance of roads and trails already in existence. It was therefore not possible to do any further work on the automobile road to the summit of the mountain. This road, the construction of which is nearly completed, is one of the main



## SESSIONAL PAPER No. 25

features of the park. Commencing in the city of Revelstoke, it follows the Columbia valley for a short distance northward and then abruptly begins the ascent. At no point on the road does the grade exceed 7.6 per cent, while the average is considerably lower and at every turn a wonderful panoramic view of magnificent scenery is presented until finally the summit of mount Revelstoke is reached at an elevation of nearly 7,000 feet. Here the traveller finds himself on a beautiful park-like plateau with groves of balsams, flower-carpeted meadows, mountain tarns or glacial lakes offering many varieties of scenery.

The principal difficulty in the maintenance of this road is the prevention of wash-outs caused by the thawing of the heavy snows. From the time when the snow begins to melt on the lower levels until it disappears from the summit about six weeks later, the road requires constant attention. New watercourses are formed each year which must be diverted into adequate culverts or great damage is liable to result to the road bed. As a result of the close watch kept on the road during the season, however, the cost of actual repairs this year was slight.

During the early summer, His Royal Highness, Prince Arthur of Connaught, passed through the mountains and held his train in Revelstoke for the express purpose of taking the drive up mount Revelstoke. I availed myself of the opportunity to ask him if he would be good enough to plant a post in commemoration of his visit, similar to that erected by his father when Governor General of Canada, and he was kind enough to consent. The new post was planted at station 635.

## TRAILS.

The mount Revelstoke trail from Revelstoke to the summit of the mountain was repaired under the direction of the fire warden. This trail affords a much shorter route for pedestrians than the motor road and is very largely used.

## FIRE PROTECTION.

Two fires occurred in the park during the year. The first was started by a settler living outside the park boundaries, who, while burning slashing, inadvertently let the fire get beyond his control with the result that it spread into the park. Some 160 acres were touched or burned over but as it was all second growth timber the damage was not great. The second fire was started by lightning on the summit but was fortunately discovered and extinguished by a party of engineers who were camped nearby before any material damage had resulted.

A new warden's cabin should be erected on the summit, also a small stable for the warden's horse. This cabin should be connected by telephone with the city of Revelstoke by an extension of our present line so that if the warden from this vantage point should observe a fire anywhere in the vicinity he would be able to summon help at once.

## RECREATION.

The Revelstoke Ski Club held its annual sports in the park as usual. These were attended with great success. Jumping contests were held for the first time on the improved grounds and the big jump, which is now considered one of the finest in Canada, met with much praise.

## GAME.

Game within the park is on the increase. Large numbers of several species of grouse can be observed at any time on the mountain sides, while bear, deer and goat are frequently seen.



## APPENDIX No 5.

## REPORT OF THE SUPERINTENDENT OF JASPER PARK.

R. S. STRONACH, ACTING SUPERINTENDENT.

Owing to the necessity of curtailing all government expenditure on account of the war, no work was undertaken in this park during the past fiscal year beyond what was absolutely essential.

## FIRE AND GAME SERVICE.

The number of wardens employed in the park has been increased from 12 to 14. This is still a very small number considering the large area of the park, 4,400 square miles, and it is hoped additional men may be added to the staff during the coming year. The policy followed in engaging wardens has been to appoint returned soldiers when possible, and it was fortunately possible to secure suitable returned men for all vacancies which occurred during the past year.

## FIRES.

No serious fires occurred in the park, although we had an unusually dry summer. Nineteen small fires were started but owing to the precautions taken by the wardens, assisted by the co-operation of the railway officials, no serious damage was done. The total expenditure for fire fighting incurred by the department was only \$410.89.

## GAME.

The number of wild animals in the park shows a considerable increase and owing to the strict protection afforded they are becoming extremely tame. Deer are sometimes seen walking through townsites and sheep are also very tame. There is a flock of the latter which can be seen at almost any time about two miles west of Pocahontas along the railway line. Beaver are also very numerous and tame, and tourists take a great deal of interest in watching them at work.

Owing to the active campaign undertaken by the wardens, the number of predatory animals in the park has been considerably decreased. The large number of coyotes destroyed is particularly gratifying as they were formerly a serious menace to the deer.

## FISHING.

Caledonia lake continued to prove an excellent fishing ground and sportsmen had little difficulty in securing fifteen—the number permitted to be taken in one day. Jack lake is also famous for the size and number of its fish, but its distance from Jasper makes it less frequented. Numerous other and more accessible lakes also provide good sport.

Last August 84,000 fry were received from the hatchery at Banff and placed in three lakes, it having been found that the 34,000 fry and fingerlings with which several lakes had been stocked in November, 1917, were thriving and in excellent condition. The lakes now stocked are Pyramid, Patricia, Beau Vert, Annette, and Edith, the fry being land-locked salmon, Atlantic salmon and cut-throat trout.



## SESSIONAL PAPER No. 25

## ROADS AND TRAILS.

No new roads were constructed during the year but the existing roads were kept in good condition to meet the needs of the tourist traffic.

The trail from Jasper to Caledonia lake was completed and small diversions to existing trails made. I would point out that for some time the future of this park will depend largely on trails and it is hoped considerable new development work will be possible in the near future.

## ROYAL NORTHWEST MOUNTED POLICE.

The number of Royal Northwest Mounted Police stationed within the park has been increased to three, a non-commissioned officer now being permanently placed at Jasper, Brule and Pocahontas.

## PUBLIC HEALTH.

The prevailing epidemic of Spanish influenza which swept the country also reached Jasper Park, but owing to the extremely healthy conditions and the precautions taken by the authorities, the number of deaths was extremely low.

## MIETTE SULPHUR SPRINGS.

The Miette sulphur springs, about 12 miles from Pocahontas, can compare with any of a similar kind in Canada. Unfortunately, it has not yet been possible to develop these springs as had been hoped. Notwithstanding the fact that patients anxious to take the treatment have to live in tents and pack in all their supplies by ponies, there was an average of 25 people staying at the springs all summer and numerous cures were effected. One case worthy of mention was a man who was unable to walk when he commenced taking the treatment, but who in a couple of weeks was able to cover on foot the 12 miles of trail between the springs and Pocahontas. He stated that he had suffered from rheumatism for a number of years without being able to get any relief, but after a month's stay he was able to return home apparently entirely cured.

## APPENDIX No. 6.

REPORT OF THE SUPERINTENDENT OF WATERTON LAKES PARK,  
R. COOPER.

Waterton Lakes park last year had the most successful tourist season in its history. Approximately 9,000 visitors entered the park. Practically all the travel was by motor-cars, most of which came from Southern Alberta towns, and the fine weather and good condition of the provincial highways leading to the park helped to make this a record season.

## WORK OF THE YEAR.

*Roads.*—The main automobile road entering the park from Cardston and Lethbridge was widened, graded, gravelled and surfaced for a distance of 1½ miles from Station 23. A number of improvements were also made to the remainder of the road and it is now in excellent condition.



10 GEORGE V. A. 1920

*Bridges.*—A new trestle bridge was erected over Pass creek on the main road to Oil City and Flat Head, British Columbia. This bridge will be a great convenience to park visitors motoring to Wall lake. The bridge on the main road entering the park over Pass creek was repaired and piers repped to prevent further washing and undermining.

#### FIRE AND GAME PROTECTION.

Big game is becoming more plentiful each year and numbers of sheep and deer are often seen in the townsite. The herd of wild elk which ranges up Castle river are increasing very rapidly; elk have been seen up Pass creek and around the lakes, and it seems probable that they will eventually be found scattered through the park, as the sheep, deer and goats now are.

There was one infringement of the park regulations with regard to the killing of deer. The guilty party was fined \$50, with costs, and the head and carcass confiscated. Other minor infringements were reported and convictions secured.

Two new warden's cabins were erected during the year, one at the international boundary, on the west shore of the lake, and the other on Pass creek. A warden's headquarters cabin is also under erection at Yarrow creek.

#### TELEPHONE.

The telephone line which extends from the Belly river west and north to Yarrow creek, a distance of 35 miles, connecting with the chief warden's and Waterton bridge cabins and the superintendent's office, has proved a great convenience. There is at present no outside telephone connection, but it is hoped the Provincial Government will in the near future extend the Pincher creek line to the park. This would be a great convenience in the administration of park business.

#### RECREATION.

Two of the chief attractions at Waterton Lakes park are boating and fishing. Last season, as usual, excellent catches of Dolly Varden and Cuthroat trout were reported. Two new passenger launches were placed on the lakes to handle the increasing passenger traffic. Mr. Hansen also operated his boat and his register shows that he carried 1,500 people to the head of the lakes during the season.

#### BUILDING.

Several new cottages were erected, all of a good type. A garage was also opened which will accommodate 50 cars. As practically all the suitable residential lots had been built upon, an addition to the townsite was surveyed last fall, and when this is completed it will be possible to accommodate all who wish to erect cottages with building lots.



## APPENDIX No. 7.

## REPORT OF THE SUPERINTENDENT OF BUFFALO PARK, A. G. SMITH.

## FARMING OPERATIONS.

We began work on the land early in April and by the 20th of May we had our crop in, which consisted of 450 acres seeded to oats. In June 200 acres of land which had produced the second crop were summer-fallowed; this was gone over a couple of times with the harrows during the summer and was left in splendid condition for seeding in the spring. Owing to the frost in July we were obliged to cut 300 acres of our crop for green feed, and from the balance we threshed 1,400 bushels, which was just about equivalent to the amount of seed used.

## HAYING.

The dry season was favourable for haying operations on the Ribstone meadow, and we succeeded in putting up about 500 tons. The quality of this hay was much better than the previous year, as there was less old bottom in it. There were also 475 tons of upland hay put up out on the summer range; part of this was for the horses at the north end and animals in the home paddock enclosure, and the balance, about 300 tons, will be baled to be shipped to other Dominion Parks.

A portable engine and hay-baler were purchased for baling hay, but did not reach us until mid-winter. We had, however, succeeded in baling and shipping 200 tons to the other parks before the end of the year.

Settlers living in the vicinity of the park, who were short of feed, were greatly assisted by the granting of hay permits. In all 32 permits were issued, covering the cutting of 800 tons on the reserve.

## FIRE-GUARDING.

The fire-guards around the outside of the park, as well as the cross-guards, were either ploughed or disked, the work being done with our own teams.

We had one fire on the reserve which nearly proved disastrous, but fortunately we succeeded, after a couple of days' fighting, in putting it out. This fire came from the east; it burned over those sections east of the Ribstone creek and we were driven back in our fight until we reached the green timber bordering the creek. Had it crossed the creek all the hay on the meadows would have been lost, and perhaps a great deal more, as it was travelling in the direction of the farm buildings.

There were numerous other fires on every side of the park, but I am glad to say we suffered no loss from any of them.

## FENCING.

Building and repairing fences was a large item of expenditure at this park during the year. With the exception of a few miles on the south boundary, we completely circled the park repairing the main fence, putting in a large number of new posts. A new fence, completely surrounding the Ribstone meadow, was erected; also a new fence surrounding the pasture and buildings at Rocky Ford. For subdivision purposes, some three miles of new fence were erected in the Cattalo enclosure. The hauling of all material required for the above fencing was quite an item, and it was all done with our own teams.



10 GEORGE V, A. 1920

## TIMBER PERMITS.

Twenty-nine dry wood permits were issued to settlers, allowing them each to take 25 cords of wood for their own use. This was especially appreciated this year, owing to the high cost of fuel.

## WILD ANIMALS.

Our herd of wild animals has increased wonderfully during the year. Six hundred and sixty-five buffalo calves have arrived since the last report was submitted, and the decrease in buffalo was 28. Of this number 17 died and 11 were shot on account of being cripples.

The elk, moose, and deer also show a fair increase, and, at this date, the animals in Buffalo Park, are as follows: Buffalo 3,561, elk 102, mule deer (estimated) 420, moose 22, antelope 2, cattalo 18, domestic cattle 11, total 4,136.

The domestic cattle mentioned above have been brought in recently, as part of the scheme which is now being carried on by the Department of Agriculture for raising cattalo.

Owing to the dry season, most of the range in the big park was cleaned off, and it was necessary to put about 2,500 buffalo in winter quarters last fall, to be fed during the winter months.

## COYOTES.

A constant hunt with two packs of dogs has been kept up during the year, and over 80 of these animals were destroyed.

## VISITORS.

Judging by the number of visitors we had during the year Buffalo Park is becoming more widely known. According to the records kept by the caretaker at the Wainwright end, 6,322 visitors entered the park at this point. The records kept at the Farm and Hardisty gate also show a large increase in the number of visitors; in all, over 7,000 people paid the animals a visit, which is a considerable increase over other years, and all expressed delight with their visit to Buffalo Park.

## APPENDIX No. 8.

REPORT OF THE SUPERINTENDENT OF ELK ISLAND PARK,  
ARCHIBALD COXFORD.

During the past year, on account of the continuance of the war, only necessary repair and maintenance work was undertaken.

## FIREGUARD.

The fireguards were ploughed in the month of July and disked later in the fall.

## FENCING.

The main fence was in good condition and only required a few new posts and braces. Through some of the muskegs, however, the posts are very rotten and should be replaced this season. Owing to the dry weather of the past two seasons the ground is now in excellent condition for undertaking this work.



## SESSIONAL PAPER No. 25

## HAYING.

The weather was very good for haying this season but the growth of hay was light owing to two dry seasons. However, a sufficient quantity was put up for the winter's feed.

## ROADS.

A few repairs were made to the road through the south corrals making it passable for cars. This was much appreciated by tourists who desired to see the animals.

## ANIMALS.

The buffalo are in very good condition but we have to feed them since the middle of January. The winter has been very mild, but owing to the lack of rain during the summer the grazing had become very scarce and insufficient for the buffalo and elk. One old buffalo bull had to be shot as it was getting poor. By shooting it a fine head and robe were saved.

The number of animals in the park at present are:—

Buffalo . . . . .	182	Moose . . . . .	57
Elk . . . . .	106	Deer . . . . .	111

## CAMPERS AND VISITORS.

This has been a record season for campers and visitors. Many requests were made by local people for sites for small summer cottages and I think this matter should be given some consideration as these people would tend to bring the park before public notice.

During the season we have had a total of 3,404 visitors.

## APPENDIX No. 9.

## REPORT OF THE HONORARY SUPERINTENDENT OF FORT ANNE PARK, ANNAPOLIS ROYAL, L. M. FORTIER.

Only such work has been undertaken during the past year as was essential to the upkeep of our old fort and its surroundings in a fairly presentable condition, all larger schemes being deferred for the time being.

The old sally port and its approaches, which were showing the ravages of time, received the necessary attention, as did also the stonework approaches to the two powder magazines, and the interior of one of them (that commonly known as the "black hole"), which was rather seriously affected by the last winter's frost, is now being put in thorough repair.

A most interesting addition to the park during the year has been the Vaughan memorial sundial, a personal gift, from Colonel Richard Cutts Shannon, of Brockport, N.Y., in memory of an ancestor.

The sundial is constructed of New Hampshire granite and bronze, and stands in an oval cobblestone area outside the ramparts of Fort Anne.

It bears upon its shaft the following inscription: "Erected 1918 in memory of George Vaughan, who served as a volunteer under General Nicholson in the expedition



10 GEORGE V, A. 1920

for the reduction of Port Royal in the ninth year of the reign of Queen Anne, A.D. 1710, and was afterwards (1715-17) Lieutenant-Governor of his native colony of New Hampshire."

The ceremony of unveiling was performed by the Lieutenant-Governor of Nova Scotia last Dominion Day, and attracted a very large number of spectators.

The Museum of Fort Anne now fills two rooms in the old officers' quarters building (now the administration building of the park) and contains an ever-growing number of objects of interest relating to the past history of Port Royal and Annapolis.

We have had not less than two thousand visitors during the year.

## APPENDIX No. 10.

### ST. LAWRENCE ISLANDS PARKS.

These parks, being situated among the Thousand Islands, in the centre of thickly settled communities, where all available lands have been taken up, render a great service to the public. Although they only afford accommodation to transient visitors or camping parties, they are visited by thousands of people every summer.

They afford a good illustration of the desirability of making public reservations among districts of exceptional scenic beauty. At the present time practically all the land along the Thousand Islands is privately owned, and if it were not for the Government Parks there would be no place where the public would have the right to land, to camp, or picnic, or fish. There is no doubt but that this will eventually be the case with many others of our beautiful scenic districts, and it shows how necessary it is that reservations should be made now to ensure that the public shall have access to them in the future.

The St. Lawrence parks are becoming more popular every year, and amply repay the small amount of expenditure necessary to make them available to the public.

Only such expenditure was made during the year as was necessary to maintain the present equipment and make the islands available to the public.

## APPENDIX No. 11.

### AGREEMENT WITH BRITISH COLUMBIA.

Memorandum of Agreement made and entered into this twelfth day of March, in the year one thousand nine hundred and nineteen;

Between

His Majesty the King, in right of His Dominion of Canada, hereinafter referred to as the "Dominion Government,"

Of the one part,

And

His Majesty the King, in right of His province of British Columbia, hereinafter referred to as the "said Province,"

Of the other part.



## SESSIONAL PAPER No. 25

Whereas the said Province has commenced the construction of a portion of the road known as the Banff-Windermere road, between Windermere, British Columbia, and Banff, Alberta, and of the which the section from the junction of the said road with the Golden-Windermere road at Sinclair Creek in the district of East Kootenay, to the eastern boundary of the said province, is incomplete;

And whereas it has been agreed between the Dominion Government and the said Province that the said road shall be completed by the Dominion Government, and that in consideration thereof the said Province among other things will grant and convey in fee simple to the Dominion Government the said road in so far as it lies in the province of British Columbia and a strip of land ten (10) miles in width lying five (5) miles on each side of the said road and immediately adjoining same and shall further undertake and agree as hereinafter provided.

Witnesseth that the parties hereto mutually agree as follows:—

1. The Dominion Government shall within four (4) years from the conclusion of peace in the present war complete the construction of the portion of the Banff-Windermere road extending from its intersection with the Golden-Windermere road at Sinclair Creek, in the district of East Kootenay, to the eastern boundary of the province, provided that the Dominion shall have the right to alter the location of the road as at present laid out or projected wherever the Dominion considers alterations advisable.

2. The Dominion Government agrees that it will hereafter maintain the said road as a public highway during the months of May to October, both inclusive, in each year;

3. The said province shall grant to the Dominion Government all that certain strip of land sixty-six (66) feet in width, known as the Banff-Windermere road, as now located or as it may be located through revisions considered advisable by the Dominion Government, and which extends from its intersection with the Golden-Windermere road at Sinclair creek, in the district of East Kootenay, to the eastern boundary of the province. Where the Government of British Columbia has not title to the lands for the road, sixty-six (66) feet in width, it shall acquire same at its expense and transfer same to the Dominion.

4. The said province will grant to the Dominion Government a strip of land along the said Banff-Windermere road as laid out and completed to an approximate width of five (5) miles on each side thereof. Provided always that as far as possible the crests of the mountains shall constitute the outside boundaries of the said areas and provided further that all minerals, precious and base, and all coal and petroleum lying in and under the land so to be conveyed shall be excepted by the province from the said grant. And provided further that grants to such parts of the lands referred to in this paragraph as are now covered by timber license or lease shall only issue to the Dominion Government when such license or lease has expired, been cancelled, or the lessee or licensee has completed cutting.

The province further excepts from such grant to the extent of any interest other than that of the Crown in the same all lands held under Crown grant, pre-emption record, agreement for sale, lease, license, or other alienation by the Crown, or in which any person has a vested interest, provided, however, that upon the cancellation, abandonment or expiration of any Crown grant, pre-emption record, agreement for sale, lease, license, vested interest or other alienation by the Crown of such lands, such lands shall thereupon automatically be vested in the Dominion Government, and the province will by all proper means available endeavour to arrange that all lands within the aforesaid ten (10) mile strip alienated or in regard to which any one had any vested interests prior to the twenty-seventh (27th) day of May, 1916, shall be secured by the province and granted to the Dominion Government, and to complete arrangements with any



10 GEORGE V, A. 1920

person holding any such lands for the relinquishment of any rights so held, and shall promptly take whatever steps are necessary for the purpose and for the end aforesaid.

In every case in which the said province exercises the powers referred to in this section the said province shall in consideration of such relinquishment or for the purpose of compensating any person for all loss or damage sustained by reason of such entry and taking possession, cause a Crown grant to be made to such person of other suitable land selected from the unalienated Crown lands in the province and the Dominion Government agree to compensate all persons who have relinquished their rights to any part of the said land and all persons who have been deprived of possession of their said lands or any part thereof outside the limits of the aforesaid way sixty-six (66) feet in width for all improvements made upon the said land by such persons who have either relinquished their rights thereto or who have been deprived of their possession if the amount of compensation to be paid be approved by the Dominion Government.

5. The grants undertaken by the last two preceding clauses shall be made immediately upon execution of this agreement and shall operate to convey the lands aforesaid as the same will be defined by the final location of the road, subject to the provisions of this agreement.

6. All lands in regard to which rights are extinguished under paragraph four (4) hereof, shall thereupon automatically be vested in the Dominion Government.

7. The province shall delegate to the Dominion Government all authority it now has or may hereafter have in regard to the utilization of timber or of any other materials from privately-owned lands or from lands now covered by any timber licenses or leases, such timber to be utilized by the Dominion Government for the purpose of constructing or maintenance of said road.

8. Mineral claims, placer claims and mining rights in the said ten (10) mile strip may be acquired only on such terms and conditions and under such regulations as the Lieutenant-Governor in Council may from time to time determine, subject to the provisions hereinafter contained.

Mineral and placer claims in the said ten (10) mile strip shall be administered by the province, provided, however, that:—

(1) No claim shall be recorded unless the Minister of the Interior certify in writing to the Minister of Mines for the province that he is satisfied that the recording and operation of such mineral or placer claim will not interfere with the scenic beauty or other features in the said area.

(2) The owner of any mineral claim, mine or placer ground shall be entitled to the use of only such portion of the surface of such mineral claim, mine or placer ground as in the opinion of the Minister of the Interior may be necessary for the effective and economical operation of the said mine or placer ground, and such area shall be leased to the owner of such mineral claim, mine or placer ground on such terms and conditions as the Minister of the Interior may specify.

(3) The possession of a free miner's certificate shall not entitle the owner thereof at any time to carry unsealed firearms within the areas in question or to take, or kill, or have in his possession any wild bird or animal therein.

(4) No person operating and working a mineral claim, mine or placer claim, shall without special authority from the Minister of the Interior be entitled to cut down any green timber standing upon the area covered by his mineral claim, mine, or placer claim.

9. The holders of existing timber licenses or leases in the areas mentioned in paragraph four (4) hereof shall be entitled to cut and carry away timber under the terms of their special timber licenses or leases and shall be subject always to the provisions of the Forest Act of the Statutes of British Columbia.



## SESSIONAL PAPER No. 25

10. All water rights in the area mentioned in paragraph four (4) shall be administered by the province under the laws of the province provided, however, that no record shall be hereafter granted by the province without the consent of the Minister of the Interior, or save upon such conditions as the Minister of the Interior may specify.

## PART II.

1. With respect to the areas described in paragraph three (3) and four (4) of this agreement, and with respect to all Dominion Parks now existing or which may hereafter be established within the province as aforesaid, and with respect to all persons or property situate or being within these areas or parks, including all alienated lands within the limits or boundaries of the ten (10) mile strip and the parks aforesaid, the province undertakes that its legislation and regulations thereunder shall at all times hereafter be conformable to and correspond with the legislation and regulations of the Dominion governing Dominion Parks generally, or the particular area or parks with which this agreement is concerned specially, so that there may at all times be uniformity; and that the province will not hereafter enact or maintain in force with respect to any of the parks, areas, property or persons aforesaid, any legislation or regulations in conflict with those of the Dominion. Provided that the province shall continue to exercise its powers for the areas and parks aforesaid with regard to licenses for motor vehicles and with regard to the liquor traffic; but that,—

(a) Holders of provincial motor licenses other than bona fide residents of the areas or parks aforesaid, shall nevertheless be subject to the payment of the Dominion Parks motor license fees as the same may from time to time be regulated or imposed by authority of the Dominion, and

(b) No permit to deal in liquor shall be granted without the consent of the Dominion Government.

2. As to license fees for motor vehicles owned or operated by bona fide residents of the areas aforesaid imposed or authorized by provincial legislation, the Dominion Government shall use its best endeavours to collect the same and subject to an annual deduction therefrom of the sum of \$5 in respect of each license fee, shall transmit the amount of such collections annually to the province.

3. The province undertakes to enact or sanction and carry into effect all such further authority legislative or executive as may be necessary for the purpose of carrying out fully and completely the terms of this agreement, according to their true object and intent.

In Witness Whereof, W. W. Corry, Deputy Minister of the Interior, has hereunto set his hand, and affixed the seal of the Department, and the Honourable James Horace King, Minister of Public Works of the Province of British Columbia has hereunto set his hand and affixed the seal of the Department of Public Works for the said province. Signed, sealed and delivered by the Deputy Minister of the Interior.

(Sgd.) W. W. CORY.

In the presence of

(Sgd.) J. E. GIBSON.

And by the Honourable James Horace King, Minister of Public Works of the Province of British Columbia,

(Sgd.) J. H. KING.

In the presence of

(Sgd.) J. E. MYERS.

*Private Secretary,*

*Minister Public Works, Victoria, B.C.*



## APPENDIX No. 12.

## AGREEMENT WITH ALBERTA.

MEMORANDUM OF AGREEMENT between the Government of the Province of Alberta and the Government of the Dominion of Canada *re* Dominion Parks in Alberta.

## LAW AND ORDER.

1. The Dominion will assume the responsibility for the maintenance of law and order in the parks, providing mounted or other police for the purpose. These police will enforce any provincial laws that are ordinarily enforced by a police force.

If any doubt should arise as to the authority of the police in the parks to act with respect to the enforcement of any of the provincial laws above referred to, the province will take whatever steps are necessary to vest them with such authority.

## MOTOR LICENSES.

2. In the case of motor-cars owned by residents of a park, the owner must take out a provincial license for motors and pay therefor the fee prescribed by the province. Such license will be issued by the superintendent of the park concerned, who will be furnished with number plates and the necessary forms by the province. Of the license fee paid the Dominion shall retain five dollars, the ordinary fee for private motor-cars in the parks, and the balance of the fee shall be transmitted to the Provincial Government. The Dominion shall provide for a suitable marking on the license plates to distinguish them from the plates issued outside the parks.

In regard to motor-cycles, one-half the fee paid shall be retained by the Dominion and one-half shall be transmitted to the province.

In regard to dealers' licenses, one-half the fee shall be retained by the Dominion and one-half shall be transmitted to the province.

The province agrees that the superintendent of a park may issue free of all fees and charges, licenses for any and all motor vehicles owned by the Dominion Parks' service.

In regard to all licenses dealt with above a license issued after October 1 (good until December 31) shall be issued for half the regular fee, the division of such fee between the province and the Dominion to be made as follows: The province to receive one-half the amount it would have received had the license been a yearly one and the Dominion to receive one-half the fee it would have received had the fee been a yearly one.

Chauffeurs operating in the park shall operate under a parks' license and the entire fee therefor shall be retained by the Dominion.

All cars while operated in a park shall operate under parks' regulations.

## THEATRE TICKET TAX.

3. The province will continue to collect theatre ticket tax in amusement places in the parks.

## LICENSES GENERALLY.

4. The province will not collect license fees with respect to guides, pool rooms, bowling alleys, amusement places, theatres, motion-picture houses, boats' livery, restaurant, or any other matters which by their nature are closely related to the tourist, but will leave the licensing and control of all such subjects exclusively to the Dominion.



## SESSIONAL PAPER No. 25

## EDUCATION.

5. Educational matters will continue under the exclusive jurisdiction of the province.

In any case where legal proceedings are carried out against a leaseholder for the collection of school taxes and such action involves the transfer of the rights of the leaseholder the Dominion will as a matter of course issue departmental consent to the transfer.

The Dominion will insert a clause in all ordinary parks' leases hereafter issued for lands, making such leases subject to the payment of school taxes.

The Dominion will give a free lease of available parks' lands for school sites so long as the property is used for school purposes.

The Dominion will put a clause in any coal mining lease (surface or under rights) issued hereafter in regard to any parks lands, forest reserves lands, or Dominion lands, making the lessees responsible for school taxes imposed by the province and making the lease subject to the payment of such taxes.

6. The Dominion will insert in any coal mining leases hereafter issued with respect to parks, forest reserves or Dominion lands, a clause requiring the lessee when a school district is organized in the vicinity of the mine to erect and maintain during the currency of the lease a schoolhouse satisfactory to the Minister of Education for the province on a site provided by the mine owner satisfactory to said Minister.

(Sgd.) CHAS. STEWART,

*Premier of Alberta.*

(Sgd.) J. B. HARKIN,

*Witness as to signature of Premier of Alberta.*

(Sgd.) W. W. CORY,

*Deputy Minister of Interior.*

(Sgd.) H. CHANDLER,

*Witness as to signature of Deputy Minister of Interior.*

Executed at Ottawa, November 23, 1918.







PART III.  
**FORESTRY.**







# FORESTRY.

## REPORT OF THE DIRECTOR OF FORESTRY.

R. H. CAMPBELL.

This report covers the work of the Forestry Branch for the fiscal year 1918-19, ended March 31, 1919.

The policy of economy which has been followed during the war was continued during the year. All controllable expenditure was kept to the lowest proportions possible and no new lines requiring large expenditure were opened up. The summer season was not a specially dangerous one for fire and the loss to the forests from this source was kept comparatively small.

While the practice of economy is necessary under war conditions, at the same time it may be pointed out that the expenditure of Canada on forestry, compared with the forest area, is the smallest in any progressive country of the world having any claim to civilization and desirous of taking its place in the world and the world markets as an important and permanent factor.

The position of Canada in the world as a forest country is a large and important one, and in the British Empire it is even more important. The authorities on forestry in the British Isles are laying stress on the unique position held by Canada in the British Empire for the supply of coniferous timber, and have been urging on the Imperial Government the necessity for providing fully for the proper protection and management of Canadian forests. The situation in Canada is complicated by the fact that the forests are divided in ownership among a number of governments which have independent jurisdiction, but it would seem that in response to the call from the Imperial Government some wider system of co-operation between the Federal and Provincial Governments might be worked out.

The legislation in Manitoba and Saskatchewan requiring the taking out of permits before setting out fire for the clearing of land has much improved the situation from the forest fire point of view. The authorities of the province of Manitoba authorized the Dominion forest service to administer the permit law and, on the whole, the system in that province has worked out well. In Saskatchewan no provision was made by the provincial authorities for an organization to carry out the law, nor did they give authority to the Dominion fire rangers to do so. In that province therefore this provision of the law has remained largely a dead letter. The province of Alberta has not as yet passed similar legislation.

The necessity for well organized research work in forestry becomes more and more manifest as the forests become more mature and timber operations develop. Forest research is an essential part of the forestry programme in all countries where forest management is taken up seriously, and if Canada wishes to remain in the van of progress and have her forest practice based on sound scientific and permanent principles, thorough scientific and careful study of the forests and forest trees should be organized on a basis adequate to the importance of the forest and to Canada, as one of the greatest forest countries in the world. A division in the Forestry Branch to initiate, organize, and develop such work should be established without delay. It seems clear that in the organization of scientific research the federal authorities should lead the way.

### WHITE PINE BLISTER RUST.

The committee appointed to deal with the white pine blister rust, as explained in last year's report, continued its operations during the year.



10 GEORGE V, A. 1920

Sample areas for the special study of the disease were located in the provinces of Ontario and Quebec, and from these it should be possible in a short time to obtain accurate knowledge of the disease and the methods by which it spreads. Scouting for the location of the disease was also continued in Ontario, Quebec and in the Prairie Provinces. No new facts as to the spread of the disease were, however, ascertained.

During the coming year the scouting and the development of the sample areas will be continued. It is also proposed to restrict the movement of currant and white pine stock from nurseries in infected districts.

STAFF.

The total permanent staff of the branch for the last year was as follows:—

Head office . . . . .	42
District inspectors.. . . .	5
Assistant inspectors.. . . .	2
Forest supervisors.. . . .	15
Forest assistants.. . . .	5
Forest rangers.. . . .	102
Chief fire rangers.. . . .	11
Inspectors of tree-planting.. . . .	9
Forest Products Laboratories, technical staff.. . . .	18
Outside clerical staff.. . . .	41
On military leave.. . . .	21
Total.. . . .	<u>271</u>

The total number of men who enlisted is 79.

APPROPRIATION.

The appropriation for the year was \$650,000. The expenditure was divided as follows:—

Salaries at head office.. . . .	\$10,922 57
Salaries of officials on military leave.. . . .	10,323 09
Travelling expenses . . . . .	590 64
Printing and stationery.. . . .	6,809 96
Miscellaneous expenses.. . . .	8,632 54
Statistics.. . . .	2,912 40
Fire-ranging.. . . .	173,494 88
Forest reserves.. . . .	311,698 90
Tree planting.. . . .	55,977 12
Forest Products Laboratories.. . . .	52,138 22
War appropriation.. . . .	6,319 81
Total.. . . .	<u>\$639,820 13</u>

NOTE.—The item of \$6,319.81 shown under War Appropriation was drawn from the Forestry appropriation and later refunded.

The field expenditure, exclusive of tree-planting on prairie farms, is divided as follows among the provinces:—

Manitoba... . . . .	\$ 88,295 82
Saskatchewan.. . . .	132,709 60
Alberta.. . . .	165,825 38
British Columbia (Railway Belt).. . . .	98,362 98
Total.. . . .	<u>\$485,193 78</u>

LIBRARY

In spite of the ever-widening range of interests which forestry is reaching the endeavour in the library has been to confine the literature strictly to forestry and to subjects pertaining to the administrative work of the branch. As regards current



## SESSIONAL PAPER No. 25

forestry literature the library is pretty complete. Much has still to be done, however, in the way of collecting foreign forestry literature, particularly that relating to French forestry which has so favourably impressed many of the Canadian foresters who have lately been brought into contact with it in the army.

During the year 55 books and 457 pamphlets were received in the library. Forty-seven magazines and papers were regularly received through paid subscriptions and 45 by exchange.

The additions to the list of photographs numbered 448. A number of these were not negatives. The small amount of survey work undertaken last year and the reduced staff on the reserves fully account for the decrease in the number of photographs received as compared with other years. Sets of lantern slides in both the head office and the offices of the district inspectors of forest reserves received attention, as well as the revision of a lecture provided to accompany them.

## PUBLICATIONS.

More than ever the effort has been to make the publication work as efficient as possible in order to secure the maximum of economy. The far-reaching changes introduced by the Editorial Committee have been loyally carried out, and while the information collected by the Forestry Branch has been made as accessible as possible to the public, as in the past, not an unnecessary page of letterpress or inch of engraving has been made. The steady demand for the bulletins issued shows that the public appreciate and make use of them. The standardizing of all printed forms used by the branch has been continued as each form comes up for reprinting, with ever increasing saving in time and money. The evidence of those in the field shows that publicity is the best means by which to fight forest fires and that an effective poster is one of the most powerful weapons used in this fight. The effort therefore to produce striking posters each year continues with experiments with new materials to obviate the use of those of which the price has been greatly raised by after-the-war conditions. The list of bulletins issued during the year is given below, and in addition there should be mentioned Bulletin 66, "Utilization of Waste Sulphite Liquor," upon which the work was practically completed, but the actual issuing of which was delayed by unavoidable causes until after the end of the fiscal year.

- Bulletin No. 63—Wood-using Industries of Quebec, in English and French.
- " No. 64—Forest Fires in Canada, 1914-15-16.
- " No. 65—Forest Products of Canada, 1917: Poles and Cross-ties.
- " No. 67—Creosote Treatment of Jack Pine and Eastern Hemlock for Cross-ties.
- " No. 1—Tree Planting on the Prairies of Manitoba, Saskatchewan and Alberta. (7th Edition, revised.)

## STATISTICS.

The work of collecting, compiling and publishing statistics relating to forest products, with the exception of poles and cross-ties, was taken over by the Bureau of Statistics of the Department of Trade and Commerce in 1917. The entire field was covered by the Bureau in 1918. The Forestry Branch co-operated in this work in the preparation of lists and schedules. The forms received were revised by the Forest Statistician of the Forestry Branch who also revised the reports before publication.

Owing to the fact that the Bureau of Statistics has legal authority to collect the desired information and has a large trained staff for the necessary compilation it is believed that this co-operative arrangement will result in the publication of more complete statistics than have been hitherto obtainable.



10 GEORGE V, A. 1920

## TREE PLANTING.

The distribution of trees from the forest nursery stations at Indian Head and Sutherland, Saskatchewan, for planting on farms on the prairies continues steadily from year to year. In the spring of 1918, 5,765,000 trees were distributed to 4,388 applicants. In the southern parts of Saskatchewan and Alberta the early part of the summer was very dry with considerable wind, so that the conditions for the establishment of plantations were far from good. Such a season, however, brought clearly before the farmers the advantages of proper preparation of the soil and of thorough cultivation thereof after the trees were set out. Although there were considerable losses in some plantations the losses were small and almost negligible in places where proper preparation and cultivation of the soil were thoroughly practised. Since the inauguration of the system of distribution of trees to prairie farmers 49,849,271 trees have been distributed and in all cases where reasonable care was taken and instructions followed the plantations have been, and continue to be, successful. The number of trees ready for distribution in the spring of 1919 was 5,388,714.

The number of trees planted in the forest reserves was 196,350, mostly white spruce, jack pine and Scotch pine. Most of these were set out in the forest reserves located among open prairie and agricultural lands and form part of a general scheme of reforestation. Some of them, especially on the Pines and the Riding Mountain forest reserves, were set out in small sample plots from which it is expected in time to derive valuable information as to the most economical and efficient means of establishing plantations.

Two experiments in seeding were also carried out, one in Manitoba and one in Alberta. On the Spruce Woods forest reserve in Manitoba ten acres were prepared by removal of the grass and disking, and were sown broadcast with white spruce and jack pine seed in the spring of 1918. Although the conditions for germination were unfavourable during a great part of the season it was found in the fall that sufficient of the seed had germinated to give 1,864 trees per acre. As this experiment was so successful in a bad season and as a method of reforestation it is comparatively cheap, it is proposed to experiment further with it. Some five acres on the Cooking Lake forest reserve in Alberta were also seeded with spruce and jack pine with results that are decidedly encouraging.

## TREE SEEDS FOR GREAT BRITAIN.

In response to requests from forestry authorities in the United Kingdom tree seeds were collected in British Columbia by officers of the branch. These were forwarded to the Forestry Commissioners for Great Britain to be used in the carrying out of reforestation plans under way in the United Kingdom. The seeds included those of Douglas fir, Sitka spruce, alpine fir, and of other species which the British authorities desire to test.

## FIRES.

The early spring season of 1918 opened badly for forest fires. The snow went off early and this was followed by a few weeks of dry weather with high winds. In the southern parts of Manitoba, Saskatchewan and Alberta the dry weather continued throughout the greater part of the season. In British Columbia the dry spring was followed by some wet weather, but in the early summer it became dry again and in the fall there was another dry, windy spell of several weeks which, especially in the Coast district, resulted in several extensive forest fires. Fortunately in the northern parts of Manitoba, Saskatchewan and Alberta the season was generally a normally wet one and the danger or damage from fire was not great. A statement of all the fires



## SESSIONAL PAPER No. 25

combated by officers of the Forestry Branch both inside and outside of the forest reserves and the causes of them is given in the following table, together with a comparison of the percentage due to each cause in the last three years.

Cause.	Number of Fires,		Percentages.	
	1918.	1918.	1917.	1916.
Unknown.. . . .	246	27	32	30
Campers and travellers .. . . .	129	14	18	20
Settlers.. . . .	205	23	22	18
Railways.. . . .	204	23	17	20
Lightning.. . . .	45	5	4	7
Lumbering.. . . .	22	2	3	3
Incendiary .. . . .	15	2	2	1
Brush disposal (other than by settlers) ..	13	2	1	—
Other known causes.. . . .	19	2	1	1
Total.. . . .	898	100	100	100

The educational work done by the forest officers and the forest and fire rangers is showing its effect in the greater care exercised in regard to fire by the public generally. A permit system for setting out fires for clearing land properly authorized by statute in every province and with proper arrangements for its enforcement will add very much to the efficiency of the forest fire prevention service and is one of the most important forward steps immediately possible and necessary.

## FIRES AND RAILWAYS.

The inspection of railways and the fire patrol along them was carried out as usual. The staff employed consisted of one permanent inspector having a general jurisdiction, and 7 temporary inspectors. The only railway about which it was necessary to make any severe criticism was the Edmonton, Dunvegan, and British Columbia Railway in northern Alberta. The fire patrols on the government-owned railways, such as the Hudson Bay Railway and the Transcontinental Railway, which do not come under the regulations of the Board of railway Commissioners, were furnished by this branch. The number of patrolmen employed was 7.

## FOREST RESERVES.

The forest reserves which are the areas unsuitable for agriculture which are set apart permanently for forest production include an area of 27,974,464 acres. The permanent staff employed thereon during the year was as follows: District inspectors, 4; assistant inspectors, 2; forest supervisors, 15; forest assistants, 5; forest rangers, 102: Total, 128. The temporary staff of rangers on the reserves numbered 63. This staff is too small for the large area to be protected and managed and it should be enlarged at the earliest opportunity. The class of men appointed as forest rangers has improved with the placing of appointments in the hands of the Civil Service Commission, who make qualifications for the work required the rule for appointment.

*Improvements.*—The construction of improvements such as houses, cabins, etc., which will enable the forest rangers to live in their districts, and such as roads, trails, telephone lines, lookout towers, etc., which improve communications and assist in the protection and management of the forests, has been continued. The systems of improvements have been planned carefully and when in the course of a few years the main systems are completed the protection and management of the forest should be carried out much more efficiently and with considerable reduction in cost. Following



10 GEORGE V, A. 1920

is a statement of improvements completed during the year with the total and average cost:—

Class of Improvements—		Total.	Average.
Cabins.. . . . .	Number 8	\$ 2,341	\$ 293
Houses.. . . . .	" 3	1,887	1,629
Stables.. . . . .	" 7	2,250	321
Other buildings.. . . . .	" 15	3,614	241
Lookout towers.. . . . .	" 4	785	196
Telephone lines.. . . . .	Miles 114	11,922	83
Fireguards ploughed.. . . . .	" 131	914	7
" cleared.. . . . .	" 4	220	55
Roads.. . . . .	" 36	10,340	287
Trails.. . . . .	" 137	4,360	32
Miscellaneous projects, such as fences, etc.. . . . .		1,580	—
Total.. . . . .		\$43,213	

*Timber operations.*—There was a considerable increase in the timber operations in the forest reserves during the year. The high cost of lumber and the high cost and scarcity of fuel resulted in many more people than usual resorting to the forests for their supplies. The number of permits issued for wood and timber was 4,142, and the quantities cut thereunder totalled 6,783,104 feet board measure; 1,065,934 lineal feet, and 43,557 cords. The number of free permits was 1,715. There were twelve millsite locations on the forest reserves occupied for cutting lumber for settlers under their permits. Twenty-one timber sales were in operation during the year. The cut of saw-timber on such sales was 1,607,362 feet board measure; of mine-props, 2,188,767 feet board measure and 1,212,752 lineal feet; and of lagging, 1,455 cords and 400,000 lineal feet.

The operators are all conducting the timber operations more carefully. Stumps are cut low, trees are utilized as fully as possible, the brush is disposed of and the tracts operated are being left in good condition for protection against fire and for reproduction of the forest.

*Fires.*—There were 116 fires on the forest reserves as compared with 159 in 1917. Eighty-one of these fires, 70 per cent, burned over more than ten acres each. The total area burned over was 109,735 acres, of which 3,529 acres were covered with merchantable timber, and 26,472 acres with young trees.

A statement of the number of fires on forest reserves in 1918 and their causes is given below with a comparison of the percentage due to each cause in the last three years.

Cause.	Number of Fires,		Percentages.	
	1918.	1918.	1917.	1916.
Unknown.. . . . .	46	40	31	34
Campers and travellers.. . . . .	23	20	21	22
Settlers.. . . . .	15	13	18	24
Railways.. . . . .	13	11	14	9
Lightning.. . . . .	4	3	5	2
Lumbering.. . . . .	5	4	3	—
Incendiary.. . . . .	7	6	4	6
Brush disposal (other than by settlers).. . . . .	3	3	1	2
Other known causes.. . . . .	....	....	3	1
Total.. . . . .	116	100	100	100

*Forest Nurseries.*—The supply of trees for reforestation on the forest reserves was obtained largely from the nursery stations at Indian Head and Sutherland, but, in order to develop such work on the forest reserves convenient to the places where planting is to be done and in order to give training in forest nursery and forest planting work to the staffs on reserves where planting is necessary, small nurseries have been started on several of the reserves. These include the Spruce Woods reserve in Manitoba, the Pines and Moose Mountain reserves in Saskatchewan, and the Cypress Hills and



## SESSIONAL PAPER No. 25

Cooking Lake reserves in Alberta. These reserve nurseries will not be increased to large dimensions, so as to be general sources of supply, but will be developed to serve the full requirements of the reserves on which they are situated.

## GRAZING.

The number of grazing permits issued during the year was 1,172 and the total number of stock grazed was 86,605. Of this total there were 10,575 horses, 48,420 cattle, and 27,610 sheep. These figures represent the striking increase over last year of 656, or 127 per cent, in the number of permits issued, and 58,714, or 210 per cent, in the number of stock grazed. The forest reserves in the Railway Belt in British Columbia are not represented in the above figures, as the Forest Reserve Regulations in regard to grazing have not yet been applied to the Dominion reserves in that province. A change of opinion has, however, been developing in British Columbia in favour of regulated grazing and a beginning in this direction will be made on provincial lands during the season of 1919. It is possible that similar action may be taken on Dominion forest reserves in the Railway Belt the following season.

The remarkable increase in the number of stock grazed on forest reserves during recent years indicates that the stock-owners are rapidly coming to appreciate the value of the range and the benefits of a regulated use of it. The regulations are designed to give special consideration to the small owner and to make the forage resources of the reserves available to the largest number of persons possible. This policy has led to a development in two directions, namely, the organization of settlers into stock or grazing associations, and the undertaking of grazing surveys and the formulation of working plans with a view to securing improvement and fuller utilization of the available forage.

The stock association is proving to be the best means of utilizing large areas, and its officers, acting in an advisory capacity, assist in the various problems incidental to range administration. The department passes upon the constitutions of these associations and is careful to see that the conditions of membership are not such as to debar any settler who is entitled by the Forest Reserves Regulations to obtain grazing privileges.

The increasing demand for grazing privileges on some of the reserves has made it necessary to obtain reliable information as to the carrying capacity of the grazing districts and for that purpose an expert has been employed in Alberta during the year to make grazing reconnaissances on several of the reserves. On the information thus obtained working plans have been made, the adoption of which has already enabled many additional stock-owners to share in the benefits of the reserves.

A very serious feed crisis which arose in southern Alberta last summer brought the grazing resources of the forest reserves into prominence. Notwithstanding the serious conditions which existed generally throughout the province, the forage growth in the forest reserves was good, and by arrangement with the forest officers approximately 25,000 head of stock were taken into the reserves from districts where feed was scarce, and were brought through the crisis in excellent condition.

## RECREATION.

The summer resorts are proving their growing popularity by attracting a larger number of visitors each year. Building operations were suspended to a large extent during the war but are now being resumed and many attractive summer cottages are being constructed. A certain amount of roadwork is being carried out from time to time to make the resorts more easily accessible.

The policy of restricting methods of fishing to those of angling and trolling is producing results in the improved fishing to be found in the lakes in the vicinity of the



summer resorts. There is no doubt that good fishing doubles the attractions of any summer resort, and the fact that the development of recreational use of the forest reserves is a means of securing public sympathy and support for forest protection is not overlooked in the administration of these resorts.

GAME.

Many of the forest reserves are entirely, or in part, game preserves, established as such by provincial legislation; and in all cases the forest officers, while not primarily responsible for game protection, co-operate with the provincial authorities in the protection of the game. In many cases where for the protection of a particular species a closed season has been declared, the value of the forest reserves has again been demonstrated by affording sanctuary to the particular game in question and permitting their numbers to increase.

FIRE-RANGING OUTSIDE FOREST RESERVES.

The fire patrol on wooded lands outside the forest reserves was continued as usual. Fortunately in a large part of the districts covered in the northern forests the season was generally favourable and the results for the season were on the whole satisfactory. The greatest damage was done in British Columbia but over 50 per cent of this damage was done by one fire which started south of the international boundary and, after burning for some days, crossed the boundary with a strong wind behind it on a three-mile front and was absolutely uncontrollable while that wind lasted.

The rangers did considerable work in the improvement of trails and other means of communication, erecting cabins and lookout towers and providing other means to improve the conditions of living in the forest and to assist in its protection.

The number of chief fire rangers employed was 11, each having charge of a large district and of about 20 fire rangers. The number of fire rangers and assistant fire rangers temporarily employed was 219. The number of fires which occurred was 782 compared with 926 in 1917. The total area burned over was 147,608 acres, of which 18,830 acres carried merchantable timber and 16,013 acres were covered with young growth.

Herewith is a statement of the number of fires outside the reserves in 1918 and their causes, together with a comparison of the percentages due to each cause in the last three years:—

Cause.	Number of Fires.		Percentages.	
	1918.	1918.	1917.	1916.
Unknown . . . . .	200	26	32	30
Campers and travellers.. . . .	106	14	18	20
Settlers . . . . .	190	24	23	19
Railways.. . . .	191	24	17	20
Lightning.. . . .	41	5	4	7
Lumbering.. . . .	17	2	3	3
Incendiary.. . . .	8	1	2	—
Brush disposal (other than by settlers)..	10	1	1	—
Other known causes.. . . .	19	2	....	1
Total.. . . .	782	100	100	100

FOREST SURVEYS.

Owing to the necessity of keeping expenditure as low as possible and to the difficulty of obtaining qualified men, the forest survey work has been reduced to as small dimensions as possible. The only forest survey party organized was the one carrying out the survey of the Petawawa reservation. It was hoped to complete the survey during the past season but toward the end of the season the party was broken up by influenza, and at the end of the season there still remained about one-third of the area



## SESSIONAL PAPER No. 25

to be surveyed. It is hoped to complete the survey during the coming year. The tract is a characteristic pine and spruce site and will give opportunity for valuable experiments in regard to the yield and the reproduction of these important species.

## FOREST INVESTIGATIVE WORK.

During the season several sample plots were set apart on the Petawawa forest experiment station, measured, mapped, and recorded for special study. These plots were marked and mapped according to the latest methods adopted by forest research institutes, and covered some of the principal types of stands, including white pine, red pine, and white birch, in various mixtures. Experiments in thinning were inaugurated on permanent sample plots. Continuous and careful observations and measurements on these plots will give valuable information in regard to the growth and yield of individual trees and of stands under differing conditions of soil, soil-moisture, density, light, and composition.

## FOREST PRODUCTS LABORATORIES.

The main laboratories at Montreal suffered seriously during the year through continued loss of staff, owing to better opportunities for salaries and advancement with industrial firms. The losses of men during the year included the chief chemist, the chief of the Pulp and Paper Division, and most of the staff in that division, the chief of the Division of Timber Physics, and finally the assistant superintendent and the superintendent of the laboratories. With these heavy losses in staff it has been difficult to carry on the work satisfactorily. The main lines of investigation have been continued and some completed.

On representations made by the Imperial Munitions Board which desired more complete and thorough tests of airplane timbers in British Columbia, the establishment of a branch testing laboratory at Vancouver was considered and finally an arrangement was worked out with the University of British Columbia for the establishment of such a laboratory. Mr. L. L. Brown, a member of the staff of the laboratories at Montreal, who had just returned from service overseas in the army, was placed in charge. This laboratory is first proceeding with tests of Sitka spruce and other airplane timbers and will later develop more general studies of British Columbia woods, such as may assist that province to compete in home and foreign markets.



TABLE 1.—Statement of Revenue, Forestry Branch for the fiscal year ended March 31, 1919.

Reserve	Timber Sales	Timber fees and dues	Timber Seizures	Grazing permit and trespass dues	Hay permits and seizures	Surface Rentals	Special Uses	Nursery Stock	Unclassified	Total
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Turtle Mountain . . . . .		76 75	13 96	2,046 50	245 85	70 00	7 00			2,460 06
Spruce Woods . . . . .		45 00	11 00	765 75	90 35					912 10
Riding Mountain . . . . .	184 00	12,521 00	654 29	862 95	725 70	67 80	615 00			15,630 74
Duck Mountain . . . . .		3,208 16	1,637 84	167 60	253 95	210 00	3 25			5,480 80
Moose Mountain . . . . .		254 60	55 00	590 65	558 20	90 00	10 81			1,559 26
Beaver Hills . . . . .		248 00	74 25	321 50	451 20		1 00			1,095 95
Porcupine . . . . .	482 91	579 63	105 90	99 85	251 75		4 50			1,524 54
Pasquia . . . . .	4,034 58	4,178 73	376 75	181 80	188 20		5 25			8,965 31
Fort à la Corne . . . . .	103 83	700 85	13 00	21 25	22 00		100 00			960 92
Pines . . . . .		519 85		387 75	96 40		1 75			1,005 75
Nisbet . . . . .		816 00	14 35	141 80	60 85		3 75			1,036 75
Big River . . . . .		107 00		66 70	145 65		14 75			334 10
Steep Creek . . . . .		57 75		25 25						83 00
Sturgeon . . . . .		28 58		53 50	54 10		3 75			179 93
Keppel . . . . .		324 85		656 10	67 60		3 75			1,052 30
Manito . . . . .		139 90	8 00	765 65	78 75		7 00			999 30
Dundurn . . . . .		17 25		302 35	53 00		2 00			374 60
Seward . . . . .				534 45	86 80		4 75			626 00
Elbow . . . . .		3 50		380 90	82 35		7 00			473 75
Big Stick . . . . .		25		3,681 75	7 25		6 25			3,695 50
Cypress Hills . . . . .	184 18	1,073 53	108 81	1,597 77	705 50	20 00				3,689 79
Cooking Lake . . . . .		48 00		610 80	237 10		73 00			968 90
Crowsnest . . . . .	1,977 27	1,156 42	76 41	5,751 07	64 80	53 55	796 20			9,875 72
Bow River . . . . .		464 24	350 00	3,702 09	128 10		45 70			4,688 13
Clearwater . . . . .	6,851 73	358 75	508 35	43 00	27 90	221 73	111 75			8,123 21
Brazee . . . . .	2,094 34	1,860 94	33 75		85	11 00	86 00			4,086 88
Athabaska . . . . .		4 50					33 75			38 25
Lesser Slave . . . . .	50 00				20 25		75			71 00
British Columbia Reserves . . . . .	250 00	278 00	79 93	5 00	27 70	93 50	23 30			757 43
Indian Head . . . . .								1,039 00	979 01	2,018 01
Total . . . . .	16,212 84	29,072 03	4,121 59	23,803 78	4,732 15	837 58	1,970 01	1,039 00	979 01	82,767 99



SESSIONAL PAPER No. 25

TABLE 2.—Statement of Timber Permits issued for the fiscal year ended March 31, 1919.

Reserve	No. of Permits.		Kinds and Quantities of Timber Authorized to be Cut.								Dues and fees
	Free	Paid	Poles or Rails	Fence Posts	Saw Timber	Cross ties	Mine Timber	Building Logs	Fuel Green	Fuel Dry	
					Ft. B.M.		Lin. Ft.	Lin. Ft.	Cords	Cords	\$ cts.
Turtle Mountain	59	14		5,450	3,000			2,500		1,425	76 75
Spruce Woods	82	8								1,353	45 00
Redding Mountain	363	940	10,350	56,610	4,344,552			42,321		7,013	12,521 00
Duck Mountain	227	266	900	23,066	1,132,260			38,495		4,164	3,208 16
Moose Mountain	10	58	90	6,255				13,880		397	254 60
Beaver Hills	115	31	400	300	31,010			21,290		1,440	248 00
Porcupine	106	41	3,500	14,000	679,009			32,892		185	579 63
Pasquia	18	69	8,200	86,082	43,408			16,816		9,158	4,178 73
Fort à la Corne	92	94	10,298	12,068	193,763			23,699		1,957	700 85
Pines	22	49	975	9,413	21,836			2,510		742	519 85
Nisbet	5	78	2,650	3,650	12,754			2,414		2,078	816 00
Big River	15	5	3,300	1,500				2,800		620	107 00
Steep Creek	14	11	100	3,183						284	57 75
Keppel	27	136	900	2,035	1,000					500	324 85
Sturgeon	7	5	1,100	500	6,512			11,500		484	28 58
Elbow	8	1						3,804			3 50
Manto	75	65	4,950	14,460	10,000			5,250		1,012	139 90
Dundurn	8	5								188	17 25
Big Stick	1									10	0 25
Cypress Hills	223	359	59,997	51,675	2,400		1,200	48,160		3,632	1,073 53
Cooking Lake	18	9		2,800				2,500		402	48 00
Crowsnest	87	102	27,375	11,810	300,600		100,174	63,609		2,304	1,156 42
Bow River	51	43	6,841	8,500			10,000	29,373		1,455	464 24
Clearwater	8	7					70,000	10,063		365	358 75
Brazeau	4	11					123,000	346,654		75	1,860 94
Athabaska (Payment on timber cut previous year)											4 50
British Columbia Reserves	13	17	5,420	2,680			30,542	10,488		428	278 00
Total	1,715	2,427	147,346	315,437	6,783,104	2,140	334,916	731,018	2,244	41,313	29,072 03



10 GEORGE V, A. 1920

TABLE 3.—Statement of Grazing Permits issued on Forest Reserves in the fiscal year ended March 31, 1919.

Reserve	No. of Permits	Number of Stock				Dues and fees collected
		Cattle	Horses	Sheep or Hogs	Total	
						\$ cts.
Turtle Mountain.....	115	1,800	299	.....	2,099	1,922 50
Spruce Woods.....	45	881	62	.....	933	765 75
Duck Mountain.....	15	610	39	.....	649	167 60
Riding Mountain.....	48	3,119	94	.....	3,213	840 95
Moose Mountain.....	72	2,034	159	.....	2,193	590 65
Porcupine.....	7	415	56	.....	471	97 35
Pasquia.....	18	712	22	.....	734	181 80
Pines.....	13	1,406	42	.....	1,448	587 75
Beaver Hills.....	56	984	97	.....	1,081	321 50
Fort à la Corne.....	1	70	.....	.....	70	21 25
Nisbet.....	9	373	27	.....	400	141 80
Big River.....	4	344	10	.....	354	66 70
Sturgeon.....	7	249	31	.....	280	93 50
Keppel.....	44	1,689	248	2,000	3,937	656 10
Manito.....	58	1,927	354	42	2,323	707 80
Dundurn.....	18	914	163	.....	1,077	302 35
Seward.....	43	802	491	1,196	2,489	521 70
Steep Creek.....	1	100	.....	.....	100	25 25
Elbow.....	47	1,118	341	.....	1,459	380 90
Big Stick.....	79	4,798	1,059	3,367	9,224	3,681 75
Cypress Hills.....	126	2,364	2,952	1,450	6,766	1,581 77
Cooking Lake.....	29	2,647	82	.....	2,729	597 80
Crowsnest.....	211	10,329	1,801	19,555	31,685	5,713 68
Bow River.....	112	8,617	2,106	.....	10,723	3,702 09
Clearwater.....	2	100	50	.....	150	43 00
British Columbia Reserves.....	2	18	.....	.....	18	5 00
Total.....	1,172	48,420	10,575	27,610	86,605	23,518 29

TABLE 4.—Statement of Timber cut on Forest Reserves under authority of Timber Sales in the Fiscal Year ended March 31, 1919.

Reserve.	Previous Sales still operating.	Sales made Current Year.	Saw Timber.	Mine Timber.				Dues Collected.
				Props.	Props.	Lagging.	Lagging.	
			Ft. B. M.	Ft. B. M.	Lin. Ft.	Cords.	Lin. Ft.	\$ cts.
Big River.....	1	.....	.....	.....	.....	.....	.....	.....
Fort à la Corne..	1	.....	69,217	.....	.....	.....	.....	103 83
Porcupine.....	1	1	2,988	.....	.....	.....	.....	7 30
Pasquia.....	2	2	426,984	.....	.....	.....	.....	958 88
Brazeau.....	3	.....	.....	.....	434,577	6	400,000	955 35
Clearwater.....	1	.....	370,359	2,188,767	.....	791	.....	6,850 73
Crowsnest.....	6	1	615,025	.....	778,175	658	.....	2,192 92
Cypress Hills.....	1	.....	122,789	.....	.....	.....	.....	184 18
Larch Hills.....	.....	1	.....	.....	.....	.....	.....	.....
Total.....	16	5	1,607,362	2,188,767	1,212,752	1,455	400,000	11,253 19



SESSIONAL PAPER No. 25

TABLE 5.—Statement showing the quantity of timber sold and revenue due during Fiscal Year ended March 31, 1919, on license timber berths within Dominion Forest Reserves.

MANITOBA.

Forest Reserve.	Timber Berths.	Area in Reserve.	Quantity Sold.			Revenue.		
			Lumber.	Lath.	Other* Products.	Dues Payable.	Rent Payable.	Total Payable.
	No.	Sq. Mls.	Ft. B.M.	No.		\$ cts.	\$ cts.	\$ cts.
Riding Mountain	4	44.33	576,953	.....	11,182	365 98	222 15	588 13
Duck Mountain .	11	99.98	11,704,835	.....	.....	4,872 93	499 90	5,372 83
Total. . . .	15	144.41	12,281,788	.....	.....	5,238 91	722 05	5,960 96

SASKATCHEWAN.

Porcupine. . .	47	944.09	37,262,064	5,865,100	14,204	15,984 68	4,261 95	20,246 63
Sturgeon. ....	12	171.93	74,065,734	8,221,514	1,482	33,982 12	862 08	34,844 20
Big River. . . .	3	260.77	13,569,790	4,191,200	.....	13,600 19	1,303 85	14,904 04
Nisbet and Pines.	4	110.08	5,875	.....	4,268	2,218 09	173 15	2,391 24
Total. ....	66	1,486.87	124,903,463	18,277,814	.....	65,785 08	6,601 03	72,386 11

ALBERTA.

Crowsnest. . .	11	259.94	6,886,721	.....	525,295	3,573 69	1,374 70	4,948 39
Bow River. ....	15	367.37	4,180,546	.....	6,362	2,286 89	1,825 60	4,112 49
Clearwater. ....	4	377.56	.....	.....	.....	.....	1,887 80	1,887 80
Brazeau. ....	11	178.04	.....	.....	.....	350 94	1,131 30	1,482 24
Total. . .	41	1,182.91	11,067,267	.....	.....	6,211 52	6,219 40	12,430 92

BRITISH COLUMBIA.

B.C. Reserves...	11	133.57	175,283	.....	1,900	158 58	667 85	826 43
------------------	----	--------	---------	-------	-------	--------	--------	--------

GRAND TOTAL.

	133	2,947.76	148,427,801	18,277,814	.....	77,394 09	14,210 33	91,604 42
--	-----	----------	-------------	------------	-------	-----------	-----------	-----------

\* The figures in this column indicate the number of units upon which the dues were calculated. They include the following: 11,182 logs, 6,957 fence-posts, 14,164 railway ties, 6,775 cords of wood, 521,430 lineal feet of mine timber, and 300 telephone poles.







PART IV  
RECLAMATION







# RECLAMATION

## REPORT OF THE DIRECTOR OF THE RECLAMATION SERVICE.

E. F. DRAKE.

The branch of the departmental service formerly known as the "Irrigation Branch" was, by authority of an Order in Council, dated 31st December, 1918, superseded by "The Reclamation Service." The change became necessary because of the increasing importance of the administrative work relating to drainage by virtue of agreements between the Dominion Government and the Governments of the provinces of Alberta and Saskatchewan as confirmed by provincial legislation, viz., "The Reclamation Act" of the province of Alberta, and "The Reclamation Act, 1917," of the province of Saskatchewan. In so far as the Dominion Government is concerned, the agreement previously referred to was confirmed by drainage regulations sanctioned by an Order in Council dated 14th January, 1919, and by "The Reclamation Act," chapter 5 of the statutes of 1919.

This legislation marks the successful conclusion of negotiations carried on for several years between the Dominion Government and the governments of the provinces of Alberta and Saskatchewan for the reclamation of submerged or swamp lands by drainage and paves the way for a progressive policy whereby large areas of now worthless land in these provinces may be reclaimed and made productive. It is anticipated that the Manitoba Government, with whom similar negotiations were carried on, will before long enact legislation on somewhat similar lines.

The problem presented by drainage in these provinces was peculiar: The ownership and control of all sources of surface water supply, including lakes, marshes, etc., is vested in the Dominion Government, which also owns the unalienated public land, while control of the drainage of land is vested in the Provincial Governments. This divided jurisdiction had invited controversy and had seriously interfered with the reclamation of submerged or swamp land and with the construction of roads, and, generally, had exercised a retarding effect upon the settlement and development of the districts comprising any considerable areas of such land.

The present arrangement is in the nature of a compromise of the apparently conflicting interests. Where drainage districts are organized in accordance with provincial laws the Dominion Government will, under certain conditions, transfer to the province, at a nominal price, any vacant Dominion lands within such districts in order that such lands, when reclaimed, shall be assessable for their fair share of the cost of their reclamation, and be thereafter sold by the province at public auction subject to such conditions as may be agreed upon at the time of the transfer. On the other hand, the Provincial Governments will, when the Dominion Government desires to take the initiative in the construction of drainage works, place at the disposal of the Dominion all their legislative machinery, upon the condition that the lands when reclaimed shall be sold at public auction, and that the purchasers shall thereafter become responsible for the maintenance of the drains, in the same manner as if the works had been initiated by the settlers themselves under provincial laws.

Provision is made in the Dominion Reclamation Act that the Governor in Council may, upon the passing of the necessary legislation by the legislature of the province of Manitoba, make the said Act extend and apply to Dominion lands situated in that province.



10 GEORGE V, A. 1920

## CLIMATIC AND CROP CONDITIONS FOR 1918.

Reference was made in my report of last year to the high cost of labour and material, which had, to a very great extent, discouraged construction work. These conditions continued throughout 1918, and, as a result, very little actual construction work was undertaken. Climatic conditions during the past year, from the standpoint of the farmer in Western Canada, could not well have been worse. The season of 1917 had been exceedingly dry and this condition continued throughout the whole of the following year, with the result that the scanty supplies of moisture stored in the soil were gradually depleted and were not replenished by natural rainfall. The result was extreme drought throughout Southern Alberta and Southwestern Saskatchewan, and practical crop failure, except in particularly favoured localities or where the land had been carefully summer-fallowed.

In the central and northern portions of both provinces a very severe frost occurred on or about 25th July--an almost unprecedentedly early date for killing frost. The result was that the wheat crop for the province of Alberta averaged about 6 bushels per acre, and the oats crop about 23 bushels per acre, while in the province of Saskatchewan the yields were 10 bushels for wheat and 21.5 bushels for oats.

In addition to the practical failure of the grain crops, the food question became very acute: Pastures practically dried up; very little hay for winter food could be harvested in the south, and the carrying of cattle through the winter became an exceedingly difficult problem. Fortunately, the winter of 1918-19 proved to be exceptionally mild and open, without severe storms. This, coupled with the assistance rendered by the Dominion and Provincial Governments and by the railway companies in transporting forage from the north or carrying cattle to the north, where they could be more cheaply fed, enabled the settlers to tide over the winter. More extended reference to the questions of forage and winter feeding of cattle will be found in the report of the Commissioner of Irrigation, which is submitted herewith.

Following the mild winter, the spring of 1919 opened very auspiciously with an early break-up and fine mild weather. A very large acreage was sown unusually early and prospects were more than usually bright until in late spring and early summer hot, dry winds and scanty rainfall blasted the hopes of the settlers. The long continued drought, and prevalence of hot winds throughout a considerable portion of the season indicate, at the time this report is written, that in the southern portions of the provinces of Alberta and Saskatchewan there will be practically a complete crop failure, except, possibly, in a few specially favoured localities or where irrigation has been practised.

In the tabulated statement which follows an attempt has been made to show the close relationship existing between rainfall and the yield of some typical field crops in Alberta and Saskatchewan.

It will be observed that the rainfall since 1915 has been scanty and slowly decreasing in depth, while for the same period the yield per acre has been decreasing on a more rapid scale. The conclusion to be drawn from this is, that the cumulative effect of a succession of dry years is a considerable depletion below normal of soil moisture and a consequent much greater proportional reduction of fertility.

In 1917, although the crop was below normal, enhanced prices made production about as profitable as in 1916 when the yield was above normal. The year 1918, however, did not bring a sufficiently substantial increase in prices to compensate for the decreased yield.

In Saskatchewan the area of each crop for 1918 was greatly in excess of the corresponding area in 1917, but the total yield was considerably less in each case. The same statement applies pretty closely to Alberta, except in the case of barley, where the area cropped was less than in 1917. But in this case, also, as might be supposed, the total yield was not proportionately as great as in 1917.



## SESSIONAL PAPER No. 25

The causes for these conditions are to be found, primarily, in the drought of 1917 and 1918, but a great deal is also due to the severe frosts which occurred in the latter part of July, 1918, in Northern and Central Alberta and Saskatchewan.

The following tables are based upon the best obtainable information. The "normal prices" are estimated, and are, possibly, rather high, but precise information of average prices for past years is not readily obtainable:—

TABLE showing Yields of Wheat, Oats and Barley, in Alberta, for the years 1915, 1916, 1917, and 1918.

Crop and Year.	Yield per Acre.	Average Price per Bushel.	Average Price per Acre.		Yield per Acre.	Rainfall at Calgary April to August.	
			\$	%		Inches.	%
Wheat—	Bush.	\$	\$	%	%	Inches.	%
Normal. . . . .	22.5 <sup>1</sup>	1.00 <sup>2</sup>	22.50	100	100	11.56 <sup>3</sup>	100
1915. . . . .	31.12	.88	27.39	122	138	12.27	106
1916. . . . .	24.99	1.33	33.24	148	111	8.93	77
1917. . . . .	18.25	1.74	31.76	141	81	6.63	57
1918. . . . .	6.00	1.92	11.52	51	27 <sup>4</sup>	5.78	50
Oats—							
Normal. . . . .	42.00 <sup>1</sup>	.34 <sup>2</sup>	14.28	100	100		
1915. . . . .	45.91	.31	14.23	100	109		
1916. . . . .	48.11	.46	22.13	155	115		
1917. . . . .	34.00	.63	21.42	150	81		
1918. . . . .	22.75	.73	16.61	116	54		
Barley—							
Normal. . . . .	28.25 <sup>1</sup>	.50 <sup>2</sup>	14.12	100	100		
1915. . . . .	32.31	.44	14.22	101	114		
1916. . . . .	29.04	.71	20.62	146	103		
1917. . . . .	22.00	.98	21.56	153	78		
1918. . . . .	16.50	.97	16.00	113	58		

<sup>1</sup>Average for 10 years, 1908-1917. <sup>2</sup>Estimated. <sup>3</sup>Average for 30 years, 1885-1914. <sup>4</sup>Results affected by frost 25th July, 1918.

TABLE showing Yields of Wheat, Oats and Barley, in Saskatchewan for the years 1915, 1916, 1917 and 1918.

Crop and Year.	Yield per Acre.	Average Price per Bushel.	Average Price per Acre.		Yield per Acre.	Rainfall at Swift Current from April to August.	
			\$	%		Inches.	%
Wheat	Bush.	\$	\$	%	%	Inches.	%
Normal. . . . .	18.50 <sup>1</sup>	1.00 <sup>2</sup>	18.50	100	100	10.00 <sup>3</sup>	100
1915. . . . .	25.12	.91	22.86	124	136	10.14	101
1916. . . . .	16.34	1.28	20.92	113	88 <sup>4</sup>	14.09	141
1917. . . . .	14.25	1.95	27.79	150	77	5.12	51
1918. . . . .	10.00	1.99	20.00	108	54 <sup>5</sup>	5.62	56
Oats—							
Normal. . . . .	38.25 <sup>1</sup>	.34 <sup>2</sup>	13.00	100	100		
1915. . . . .	43.48	.32	13.91	107	114		
1916. . . . .	43.06	.46	19.81	152	113		
1917. . . . .	27.25	.62	16.90	130	71		
1918. . . . .	21.50	.70	<sup>2</sup> 15.05	116	56		
Barley—							
Normal. . . . .	26.75 <sup>1</sup>	.50 <sup>2</sup>	13.38	100	100		
1915. . . . .	31.74	.46	14.06	109	119		
1916. . . . .	27.00	.77	20.08	155	101		
1917. . . . .	21.00	1.00	21.00	157	79		
1918. . . . .	17.00	.88	14.96	112	67		

<sup>1</sup>Average for 10 years, 1908-1917. <sup>2</sup>Estimated. <sup>3</sup>Average for 30 years, 1885-1914. <sup>4</sup>Results affected by rust. <sup>5</sup>Results affected by frost 25th July, 1918.



AWAKENED INTEREST IN IRRIGATION.

As the result of successive dry seasons and partial or complete crop failure there has been a sudden and widespread awakening to the value of irrigation either as a form of crop insurance, or as a necessity to successful farming in the semi-arid regions of Southern Alberta and Saskatchewan. In his report which is submitted here-with the Commissioner of Irrigation has discussed this in such detail that little further comment is required. I desire, however, to draw attention to a few phases of the problem to which the Commissioner has not referred.

In the early days of irrigation development the then Commissioner, Mr. J. S. Dennis, roughly defined the so-called semi-arid district as a tract of some 50,000,000 acres, bounded roughly as follows: From the international boundary northward along the lower slopes of the foothills of the Rocky mountains in Alberta to the north line of township 28, thence easterly along the township line to about range 10, west of the 4th meridian, thence northeasterly across the Alberta-Saskatchewan boundary to a point some thirty miles south of Battleford, thence southeasterly to the "Elbow" of the South Saskatchewan river, and following approximately the line of the Moosejaw Portal branch of the Canadian Pacific railway, to the international boundary.

The cycle of wet years from about 1896 to 1909 caused many to assert either that it had been a mistake even to characterize this region as semi-arid, or that the climate has materially changed as the result of settlement and cultivation of the soil, and for the time these people seemingly had the better of the argument. But the recurrence of dry years, the serious crop failures resulting from drouth in 1910, 1914, 1917, and 1918, with the present prospect of a more serious failure in 1919, amply justify Mr. Dennis' early summary of the case.

Assuming that there are some 50,000,000 acres of land requiring irrigation, or that would be benefited by irrigation, it has never been asserted that all of this land could, or should be irrigated. Much of it is too high, or too rough, to be irrigated from any available source of water supply, and other portions are unsuitable for irrigated farming for other reasons. There has been a considerable development of irrigated farming within this district as shown, approximately, in the following schedule:—

<i>Constructed.</i>		
Canadian Pacific Railway Projects—	Acres.	Acres.
Western section.. . . . .	223,000	
Eastern section.. . . . .	400,000	
Lethbridge.. . . . .	130,000	
		753,000
Canada Land and Irrigation Company.. . . . .		202,000
Private (small) projects.. . . . .		150,000
		1,105,000
<i>Projected.</i>		
Lethbridge Southeastern (estimated area).. . . . .		350,000
United Irrigation District (estimated area).. . . . .		30,000
Lethbridge Northern Project (estimated area).. . . . .		150,000
North Saskatchewan Project (estimated area).. . . . .		1,000,000
		1,530,000

If all the irrigable lands within the projects now constructed are actually irrigated (which is by no means true), and if works were built to serve the lands in all the projects so far suggested for construction, the total irrigated area would be 2,635,000 acres, or about five per cent of the semi-arid district. It has been said that the available water supply in western America, referring particularly to the western United States, is sufficient for the irrigation of about ten per cent of the total area of land requiring irrigation. The statement is probably true in a general sense and it may



## SESSIONAL PAPER No. 25

safely be assumed that even with the most careful system of conservation and use the water supply in Southern Alberta and Saskatchewan cannot be made to irrigate more than 5,000,000 acres, or ten per cent of the land that requires, or would be benefited by, irrigation.

The principal streams traversing the region referred to are the North and South Saskatchewan, Bow, Red Deer, Waterton, Belly, St. Mary, Milk, and Oldman rivers.

Bow river supplies the Canadian Pacific Railway Company's several projects and that of the Canada Land and Irrigation Company. It may be found possible to so conserve its flow as to serve some additional land, but no considerable area.

St. Mary and Milk rivers are international streams and part—approximately one-half—of their combined flow has been assigned by treaty to the United States; the remainder is already fully appropriated in Canada. The total flow of these streams, plus the Belly and the Waterton rivers, will barely suffice for, if indeed it does not fall short of, the requirements of the development already in contemplation, viz., the Lethbridge Section of the Canadian Pacific railway, the United Irrigation District, and the Lethbridge Southeastern Project.

Oldman river will furnish about enough water for the proposed Lethbridge Northern Project with its possible extensions.

Red Deer river flows in a deep and narrow valley from which it would be difficult and expensive, if not impossible, to divert it to adjacent lands.

Most of the smaller streams are already fully appropriated by settlers living along or near them, and little further development of this kind is possible except by the construction of reservoirs for the control of water that now runs to waste in periods of flood.

There remain the North and the South Saskatchewan rivers. The latter, formed by the Bow and Oldman, flows in a very deep, and generally quite narrow, valley. It is believed to be impracticable, within reasonable cost limits, to divert water from it either by gravity or by pumping for the irrigation of the adjacent bench lands, although some development of the valley lands by pumping is quite feasible.

Investigations are now being made to determine the feasibility of diverting water from the headwaters of the North Saskatchewan near Rocky Mountain House, and carrying it eastward for the irrigation of a considerable, but as yet undefined area of land in Central Alberta and West Central Saskatchewan. It is probable that this may be found practicable from an engineering viewpoint, but surveys are not yet sufficiently advanced to warrant any conjecture as to the cost of the undertaking or its commercial feasibility. It may also be found possible to divert water from this stream at some other point for use in the same district, but no surveys of any description have yet been made to test this.

It is thus apparent that further irrigation development is only possible within somewhat narrowly circumscribed limits, and many of those who are now agitating for the extension of existing irrigation systems, and for development of new ones, are doomed to disappointment.

Irrigation should be developed as fully and as rapidly as possible, but the available water supply will not suffice, and cannot be made to suffice, for the irrigation of more than a small fraction of the area for which water is required. And this is true even though steam flow be controlled and waste prevented by means of storage and regulating reservoirs.

The most disappointing feature of present-day irrigation development in Western Canada is the undisputed fact that in spite of successive dry years, and repeated crop failures, many of those who have water available have failed to use it when use would have saved their crops. Works built at considerable expense have been permitted to decay and have not been repaired because, in some years, the rainfall was sufficient for crop production and it was believed, or rather hoped, that each succeeding year



10 GEORGE V, A. 1920

would be a "wet" one. Thus when the drouth came the restoration of the works was deferred from day to day in the hope that rain would make their restoration unnecessary, and when finally water was required immediately to save the crop the repairs could not be made in time and the crop was lost.

## SUMMARY REPORT ON IRRIGATION AND CANADIAN IRRIGATION SURVEYS.

(P. H. PETERS, Commissioner of Irrigation and Chief Engineer.)

### ORGANIZATION OF STAFF.

The organization of the staff was similar to that of last year with the proposed change carried into effect of combining the irrigation and hydrometric work in certain districts. All field survey development work having been discontinued, the staff, mainly in the field but also in the office, has been correspondingly decreased in comparison with the years prior to 1917. A number of men on the permanent staff left our employ during the year, being drawn away by the considerably higher remuneration offered by private corporations. This had the effect of disorganizing the staff, and particularly in the hydrometric division, the office was undermanned during the whole of the year. Exclusive of summer assistants and other temporary employees, the number of persons employed on the staff was forty-three; twenty-nine being employed in the office and fourteen in the field.

### STREAM ADMINISTRATION.

The work of transferring our records to the new system which has been developed, was carried on actively throughout the year. The water administration engineer devoted all of his time to this work and a great deal of progress was made during the year in getting all the various details finally worked out. Difficulties were again experienced with knotty points that had to be dealt with but it now appears that most of these have been straightened out and the largest part of the work remaining will be the final typing and checking of all the records.

### HYDROMETRIC SURVEYS.

The following extracts from a report submitted to Chief Hydrographic Engineer cover in a very brief and general way, the work carried on by the hydrometric surveys division during the year.

"In order to economize as much as possible, only the most important work was undertaken. A number of the less important gauging stations were discontinued and the regular field staff was reduced to nine district engineers during the open-water period. Five of these did hydrometric work only, but the remaining four did irrigation inspections also, and therefore only spent part of their time on hydrometric work. The engineer in charge of the Calgary district also looked after the current-meter rating station. During the winter period there were seven field engineers who spent all of their time on hydrometric work.

"During the open-water period, records were taken at 138 regular gauging stations on streams in Alberta and Saskatchewan, at about 110 gauging stations on irrigation ditches and canals and at nineteen stations on lakes. Winter records were taken at ninety stations on streams during the past winter.



## SESSIONAL PAPER No. 25

"During the year forty-four current-meters were rated. Fourteen belonged to the British Columbia Hydrometric Survey, three to the Manitoba Hydrometric Survey, one to the Ontario Hydro-electric Power Commission, two to the Canadian Pacific Railway Company and the balance, twenty-four, belong to this office.

"The staff was increased at the beginning of the year for the purpose of bringing the office work up to date and it was planned to have the daily discharges computed regularly up to date as the records came in, instead of leaving most of this work until the winter months. We were unable, however, to maintain the necessary staff, and the office work is still behind. During 1918 there was a scarcity of engineers, and many openings became available for members of our staff. In the nine months from April to December, fifty per cent of the staff of engineers on hydrometric work resigned. As a consequence many of the best qualified and most experienced engineers left and had to be replaced by engineers with no previous experience in hydrometric work. This seriously affected the efficiency of the staff, as it takes considerable time to gain the information and experience necessary to do good work. The field work was kept up but the office work fell behind.

"The records for the past year are of considerable value as 1918 was an exceptionally "dry" summer. The spring break-up was quite normal in the mountain streams, but on the prairie it came very suddenly and, as the ground was frozen, a large portion of the melted snow rushed into the streams and many of the small prairie streams were abnormally high. Only a small portion of water went into the ground and, following a summer of low precipitation, the prairie and foot-hill streams soon fell below normal and remained so for the remainder of the year. The high temperatures, however, kept the mountain streams nearly up to normal during the summer. When the temperature in the fall became too low to melt snow, the mountain streams also fell and the flow for most streams during the winter of 1918 was exceptionally low.

"The results of the special investigations of Sturgeon-weir and Churchill rivers near the Manitoba-Saskatchewan boundary, started in the fall of 1917, proved to be of considerable value and were, therefore, resumed last fall. These streams have good winter flows, and favourable sites for water power development exist. They will, therefore, probably assist in the early development of rich mineral deposits in that locality. Now that the war has terminated, the development of the resources in the north country will probably be resumed, and we should therefore, plan to extend our investigations of the winter flow of the larger streams in Northern Alberta and Saskatchewan.

"During the year the investigations of lake levels were increased, and during the past few months a number of stations were installed on lakes and marshes and lake outlets for the purpose of gaining records for the study of drainage schemes."

## FIELD WORK.

Reference was made in last year's report to the very difficult conditions concerning water supply for domestic, municipal, and industrial purposes over a considerable area of the drier parts of Alberta and Saskatchewan and to the efforts that were being made to collect data for use in bettering these conditions. This work has been actively followed up during the past year by our inspecting engineers, who have submitted reports concerning all domestic water supplies and wells that came to their notice throughout the country. We have also been able to catalogue considerable data of this kind which has been submitted by other persons and organizations interested in the development of this area.

In this connection the summary report of the Geological Survey for 1915 contained a report and map by Dr. D. B. Dowling, which outlined the probable artesian well area in that very dry region east of Lethbridge. It is interesting to note, as the result of the Dominion Government's activity in this matter, that up to 1918 the drilling of thirty



10 GEORGE V, A. 1920

successful wells had been reported in this area. The drilling of these wells proves the general correctness of the whole artesian area as defined by Dr. Dowling, except along the extreme eastern edge where up to date no drilling has been reported.

A commencement was made last year to reinspect all stock watering reserves. No special staff has been available for this work and it has been necessary to make the best progress possible by fitting it in with the other duties of our inspecting engineers. During 1917, fifty-nine reserves were inspected, and during 1918 fifty.

As indicated under that heading, the field work on the hydrometric surveys was carried on during both the summer and winter seasons in such a manner as to ensure the continuity of our stream flow records. Otherwise, as a general rule, only such field work as was necessary for administration was carried on. The small amount of special field work which was done is referred to briefly below.

A short field reconnaissance was made on the Lethbridge Northern Project and will be referred to further under that heading.

Mr. J. S. Tempest carried out the construction of a small earth dam at the outlet of Elkwater lake. This lake lies in the Cypress Hills Forest Reserve about thirty miles southeast of Medicine Hat and is frequented as a summer resort by a number of people. The dam was built with a view to maintaining the water-level at a certain elevation, in order to improve the lake as a summer resort. The lots laid out around the lake are owned by the Dominion Government.

In the late fall Mr. Tempest also spent several weeks making a preliminary survey to gain some additional information regarding the feasibility of draining Waterhen lake and marsh which lie about thirty-five miles southeast of Prince Albert.

During the fall of 1917 some river improvement work was undertaken on the Highwood river a few miles above the town of High River. The works, consisting of pile deflecting groins and an earth levee, were built to stop the Highwood from changing its whole course and running down the Little Bow river. Observations of the high water-level in the Highwood river during the spring freshets of 1918 showed that the lower part of the earth levee was not high enough to be safe during a really big flood. In the fall of 1918 a camp was erected, and by utilizing our own horses, the levee was raised to what is considered to be a safe elevation.

The same plan as last year was followed in combining the irrigation and hydrometric work in the Cypress Hills country. Instead of requiring four inspecting engineers, however, as had previously been the case when using horse transport, the work was done by two inspecting engineers, each provided with a Ford motor car and one assistant.

*Cypress Hills District Northwest.*—The season's work comprised 198 actual working days. Ninety-seven inspections and seven surveys were made. Eighty-six stream gaugings were made and data gathered concerning thirty-seven wells. The number of miles travelled by train was 1,648 and by motor car 7,286.

*Cypress Hills District Southeast.*—The season's work comprised one hundred and ninety-six actual working days. One hundred and forty-five inspections and seven surveys were made. Three hundred and fifty-six stream gaugings were made and two new gauging stations were established. Data were gathered concerning seventy-seven wells and four domestic water supplies. The number of miles travelled by train was 2,471, by hired livery 947, and by motor car 7,299. These figures include the work done on the special measurement of early spring run-off.

*Macleod District.*—The season's work comprised one hundred and forty-six actual working days. Fifty-seven inspections and two surveys were made. Two hundred and thirty-five stream gaugings were made and data were gathered concerning sixty-one wells. The number of miles travelled by train was 830 and by motor car 5,461.



## SESSIONAL PAPER No. 25

The irrigation and hydrometric work in the district were combined and the engineer was provided with a Ford motor car for transportation and with an assistant.

*Special Inspections—Domestic, Municipal, Irrigation and Industrial.*—This work was carried out under the immediate supervision of the office engineer. The office engineer supervises the work of all inspecting engineers and particularly that of the two special inspectors, and sees that for each trip the inspections are properly grouped, as regards economy of time, travel, expense and the urgency of an early report. The office engineer examined and checked three hundred and forty-eight plans of all descriptions including forty-six descriptions for right of way.

The total number of inspections made in Saskatchewan was seventy-five, including eleven surveys of all descriptions, involving 8,671 miles of travel by train and 1,640 miles by motor car or other means.

In Alberta, seventy-two inspections and ten surveys of all descriptions were made involving 5,918 miles of travel by train and 1,914 miles by motor car and other means.

## MUNICIPAL WATER CONSUMPTION DATA.

The collection and compilation of municipal water consumption data were inaugurated towards the end of the year 1914, and in the year 1915 we received information complete for the year from fifteen cities and towns in Alberta and Saskatchewan. In the following year we received records for the whole year from the same cities and towns. During the year 1916 an endeavour was made to obtain this data from a greater number of places, with the result that for the year 1917 we received complete records from twenty-one cities and towns in Alberta and Saskatchewan. During 1918 records were received from eighteen cities and towns.

## LARGE IRRIGATION PROJECTS.

*Eastern Section C.P.R. Irrigation Block.*

No new large construction work was undertaken during the year in this section, although considerable work was done as ordinary maintenance and in enlarging and straightening secondary canals in those districts where a large proportion of the land has been sold and occupied by settlers.

There still remains a considerable block of land in this section which has not yet been finally classified by the department and no further progress in this connection was made during the year. The company sold a great deal of land last year, and has now disposed of a large proportion of the irrigable land already classified which is close to the railways already constructed.

The year was very dry and heavy demands were made for the delivery of water in those areas already settled and under crop. The results shown at our Brooks experiment station are typical of conditions throughout this section; the dry crops were a practical failure while the irrigated lands produced excellent returns. In the Bassano colony very little water was used and the result was a general crop failure with the notable exception of one or two farmers who, by utilizing the irrigation water, produced bumper crops with splendid financial returns. In the Duchess colony, a few miles north of Brooks, a very general use was made of the water and while the lands were not all well prepared for irrigation, excellent results were obtained. In the Duke of Sutherland colony, lying just north and east of Brooks, there was also a very general use made of the irrigation water with excellent results. In this colony the settlement is older and consequently the lands are better prepared for irrigation; the results of the more thorough cultivation and preparation were apparent in the crops produced. The



10 GEORGE V, A. 1920

company itself undertook to cultivate, seed and irrigate forty acres on each of some twenty-five ready-made farms in the St. Julien colony lying just south of Tilley. The work was started rather late in the season and under such conditions that the best results could not be expected. The lands were all sowed to some kind of grain and all produced a crop. The results were indicative of what might be accomplished during the first season by an energetic settler going on the land in the early spring. Figures submitted by the company covering the whole of this section show that 24,440 acres were irrigated during the season.

*Western Section C.P.R. Irrigation Block.*

No new large construction work was undertaken during the year in this section. The usual annual programme of maintenance and betterment was carried out.

The greater part of the land in this section has been sold and settled for a number of years and a large area is under cultivation—mainly in grain crops. The settlers have never made any general use of the irrigation water from year to year, and as a consequence the land has not generally been prepared for irrigation and the smaller ditches have lacked care. When the season developed so extremely dry, many of the farmers called for water, and during the height of the irrigation season there was a very heavy demand on parts of the system. The call on the company's operation staff was very great and for a considerable time they were working "night and day" in order to meet all the demands. It is believed that the situation was handled very efficiently, and that satisfactory delivery was made to all the water users. Figures submitted by the company covering the whole of this section show that 25,191 acres were irrigated.

*Canada Land and Irrigation Company.*

In the spring of 1918 a considerable amount of work remained to be done before the company could carry water through its canal system to the irrigable lands. The company carried out an energetic programme during the season with a view to completing all this work. By the second week in June the system was in shape to commence delivering water to the Lake McGregor reservoir, and about June 14 the water was first turned into the canal. The remainder of the season was spent in "priming" the section of the canal between the intake and Lake McGregor. The most tedious job was priming the East Arrowwood syphon. This was completed about August 1 and about August 9 the water first reached Lake McGregor. A flow of from fifty to two hundred second-feet into the reservoir was maintained, with but few interruptions, until late in the season. At the end of the season the reservoir had been filled up nearly to the elevation of the bottom of the outlet gates at the south end.

From this point on the company did a great deal of improvement work on the very difficult section of the main canal which is located on the steep sidehill of the Little Bow river. It also completed the rather heavy cut which the main canal runs into on entering the Little Bow reservoir. At the end of the season the work on the section between Lake McGregor and the Little Bow reservoir had been practically completed so that the company should be ready to commence carrying water through this section early in 1919. From the Little Bow reservoir on to the first unit of lands to be irrigated, it is understood that the canal is all in good shape.

Speaking generally the company have completed all the large construction work contemplated for the present, and is now prepared to commence actual operation of the system. It will, however, take practically the whole of the 1919 season to complete the priming of the main canals and during this period a good many difficulties and interruptions may be expected.



## SESSIONAL PAPER No. 25

*The Alberta Railway and Irrigation Company.*

This company is controlled and operated by the Canadian Pacific Railway Company and is commonly referred to as the C.P.R. Lethbridge Section. The city of Lethbridge is the centre to which the tract of irrigated land is tributary.

The season being extremely dry in this district, there was a very heavy demand for water—probably the heaviest in the history of this section. The St. Mary river, which is the only source of supply tapped by the company's system at this time, was practically dry below the intake of the irrigation canal during the peak load period. During this period a considerable quantity was being diverted out of the river south of the international boundary by the United States Reclamation Service canal.

While for a certain period the whole available supply in the river was being used, the supply at the intake was always sufficient to serve all of the lands under the canal. A good deal of difficulty however, was experienced in making proper deliveries of water to the farmers in the eastern end of the section and for a time some of these did not receive a proper supply. The trouble was due to certain of the company's supply canals having become silted up to such an extent that they would not carry a full supply of water. As soon as this became apparent the company's officials made strenuous efforts to overcome the difficulties, and did everything that was possible under the circumstances.

The effort to clean out the silted canals was maintained throughout the irrigation season by operating a floating dredge in the largest of the secondary canals that was affected, and later in the fall after the ditches were dry, a large amount of betterment work was carried out. The canals are now all in shape to make proper water deliveries and it is understood that the company's programme for 1919 contemplates a very considerable expenditure in general betterment work over the whole system.

Figures submitted by the company covering the whole of this section show that a total of seventy thousand acres were irrigated during the season.

*Coaldale-Lethbridge Water Users Association.*—This association was formed on or about July 3, 1918, with the idea of creating an organization through which the water users, under the Alberta Railway and Irrigation Company's system, could act in unison concerning all matters pertaining to irrigation. There were about seventy-five charter members all representing that part of the system lying to the east of Lethbridge in the district indicated by the name of the association.

The determination to form this association was no doubt brought to a head by the shortage of water referred to in the preceding section of this report, but the necessity of such a course had long been discussed as a means of gaining a proper distribution of the water among the farmers under this system.

The company's system was originally constructed on the old fashioned plan of providing only the main and secondary supply canals, and requiring the farmers themselves to construct and maintain all the laterals between the company's canals and the fields. Under this system there are many laterals of considerable length serving a considerable number of farmers. With one exception there was no organization among the farmers to provide for co-operative management of the laterals, and cause an equitable distribution of the necessary maintenance work or of the water. The result is the same as has always been experienced elsewhere under similar conditions. The laterals are not properly maintained, and the farmer at the tail-end of the lateral very often goes short of water. Under this condition, certain farmers suffer from a shortage of water when a sufficient quantity is being supplied to the lateral from the company's canal. The individual farmer has no means of ascertaining whether the company is making a proper delivery to the lateral or not.

On August 30, Local Union of East Lethbridge No. 141 of the United Farmers of Alberta, became interested in the same matters as were being discussed by the Coaldale-Lethbridge association and contemplated some separate organization. Finally, however,



10 GEORGE V, A. 1920

their activities were directed along the same lines, in creating the organizations under the Alberta Irrigation District Act referred to below.

Without trying to describe the evolution of this activity in its proper sequence—the outcome of the various meetings held was a final crystallization of the farmers' views, that the requirement was an organization based on these three primaries; co-operative strength in respect of questions affecting the interest of the company and the interests of the farmers; an organization with full power to control, maintain and operate the laterals; and an organization with power to make levies of money to cover all necessary expenses. As soon as these ideas became clearly understood it was decided that the best course was the organization of water users districts under the Irrigation District Act.

The next large question was to decide on a proper division of the system for the formation of the water users districts. Certain farmers urged the formation of one large district embracing all the territory east of Lethbridge, pointing to the advantage that lay in the great weight one large association would have in discussing questions with the company. Other farmers opposed this idea on the grounds that the one large association would be too unwieldy and that possible failure under inexperienced management would wreck the whole movement. Others suggested very small districts, handling only one sub-lateral. Finally a middle course was adopted contemplating the formation of six water users districts covering the territory east of Lethbridge, each one including from twenty-five to thirty-five sections of land.

From September 1918 until January 1919, with a break in December due to the "Flu." epidemic, several organization meetings were held under the auspices of the Lethbridge-Coaldale association and with the assistance of the East Lethbridge U.F.A. Local No. 141. At the present time it is understood that all the necessary petitions have been signed calling for the formation of two of the water users districts—viz., the North Lethbridge district and the Coaldale district. Neither of these districts has as yet been formally erected under the Irrigation District Act. In the meantime, the Coaldale-Lethbridge association is acting as a mother organization which it is proposed to maintain until all the water users districts contemplated are formally erected under the Act.

In the southeast corner of the Lethbridge Section the Canadian Pacific Railway Company created a "ready-made farm" colony, comprising about five thousand nine hundred acres. This colony was practically settled in 1917 and during the past season proceeded independently of the Coaldale-Lethbridge Association to form a water users district. It was duly erected into the "Ready Made Water Users District" on February 18, 1919.

*The Taber Irrigation District.*—The very dry season of 1918 caused a complete crop failure in this district. The farmers all realized what a difference there would have been if their expectations concerning the construction of the irrigation ditch had been realized and the feeling became very tense. Efforts were made by the district to complete some contract with the Canadian Pacific Railway Company which would bring about immediate construction. No material progress, however, towards actual construction was made during the year.

On February 11, 1919, over four hundred farmers, a very large proportion of whom reside in the Taber district, held a meeting at Taber. An hour was devoted to a discussion of the affairs of the Taber Irrigation District, and the discussions which ensued reflected the very strong feeling under which the different speakers were labouring. The principal resolution passed unanimously by the meeting asked the Canadian Pacific Railway Company to enter into a contract with the district at such an early date that construction might be carried out during 1919, and water delivered to the land in 1920. Now that the war is over it is confidently hoped that the works for this district will be constructed during 1919.



## SESSIONAL PAPER No. 25

*The Lethbridge Northern Irrigation Project.*—This project has been under investigation by the department since the year 1913, and full reports on the various engineering features and estimates of cost will be found in the Annual Reports on Irrigation Surveys for the years 1914-15-16.

During 1918 the president of the Lethbridge Board of Trade, suggested that the system be extended to include the greatest possible area, but that each quarter-section be limited to forty irrigable acres. The idea was to benefit a greater number of people and give each settler a water right to a sufficient acreage to ensure adequate supplies of feed for stock. It was thought that this plan would meet with the approval of the majority of the land owners, and the department was requested to make the further surveys necessary to estimate the cost on the above basis.

In October, 1918, a reconnaissance was made in the Sundial district to determine the feasibility of extending the canal system across the Little Bow river, and the suitability of the land for irrigation. A report of this work is to the effect that the extension is feasible.

From the information gained on this reconnaissance and preliminary surveys made in the Sundial district in 1914, contour township sheets were prepared, the land was classified and a canal system was projected on which to base an approximate estimate of cost.

In the Iron Springs and Monarch districts, the 1915 estimate was revised, the irrigable area being reduced to forty acres in each quarter-section, and the canal capacities reduced accordingly. The system was also extended to include the Barons and Carmangay districts as originally estimated in the 1914 report. The main canal was redesigned as to size and the location changed to include the Keho lake reservoir. The advantage in using this reservoir is that by drawing water from Keho lake for the maximum draft period of the irrigation season, the main canal from the intake to the reservoir can be reduced in capacity from 1,170 second-feet to 870 second-feet.

Three tables, constituting a summary of the estimated cost of this project, have been prepared but are not included in this report. Table I, gives the total cost of the lateral systems under each branch including the branch, and also the total irrigable area under each branch. Table II, gives an itemized summary of the cost of the main canal and structures from the intake to the division gate at the Lomond branch. The total irrigable area is 92,740 acres and the estimated cost \$3,561,744 or \$38.40 per acre. Table III, has been added for comparison purposes and gives an approximate estimate of cost on the same forty acre basis, but excluding the Sundial district. The total irrigable area is then 48,450 and the cost \$39.50 per acre. It shows that by excluding the Sundial district, the cost is decreased \$1.10 per acre.

The unit prices used were somewhat higher than those used in the 1915 estimate, but not as high as present prices. It is impossible to foretell what prices will be at some indefinite time in the future when this project may be constructed, but it is not reasonable to assume that the present abnormal economic conditions will continue for any great length of time, and hence a scale of prices has been adopted which may be expected to prevail within one or two years.

---

The interest taken during the winter of 1918-19 in irrigation development by the farmers in the south country is referred to more particularly in the following sections of this report. The interest was very keen indeed in the district north of the Oldman river and between Monarch and Turin. Irrigation meetings were held on February 19, 20, and 21, 1919 at Turin, Coalhurst and Monarch with respective attendances of one hundred and thirty, eighty, and seventy farmers. These meetings were all strongly in favour of irrigation with the partial exception of the meeting at Monarch where the members of a colony of Hollanders surrounding this town were opposed to irrigation development.



10 GEORGE V, A. 1920

During the winter there was no interest displayed in irrigation development with a view to having this project extended either in the Barons-Carmangay district or in the Sundial district.

On March 27, 1919, at Lethbridge a committee representing the land owners under the Lethbridge Northern Project decided to proceed immediately to petition for the erection of the Lethbridge Northern Irrigation District under the provincial Irrigation District Act of 1915. The area to be formed into this district does not include the Sundial district or the Barons-Carmangay district. A start was made during the first week in April to circulate the necessary petitions in this respect, but it is not known at the time of writing this report whether or not the petitions have been completed and submitted to the proper provincial authorities.

#### *The Lethbridge Southeast Irrigation District.*

This project has previously been referred to as the Milk and St. Mary Rivers Project, but the name now adopted seems to give a better idea of the geographical location and is therefore more desirable. No work has been done on this project during the year, other than a new office study of the question of water supply from the several original sources which it is proposed to tap, and various incidental office studies that were made concerning special inquiries made by interested land owners in different sections under the proposed project. The great interest which developed during the past winter urging the development on the part of the land owners is described in the next section of this report.

During the winter petitions in favour of this development were received, signed by five hundred and sixty-one owners, and representing one thousand four hundred and sixty-six quarter-sections of land. This indicates the very widespread interest that developed, but must not be accepted as representing the full measure, because in many of the districts the petitions were not completely circulated.

*The Irrigation Development Association.*—This association was formed at Lethbridge on March 14, 1919, following the general irrigation meeting held at Lethbridge on the same day where the following resolutions were passed.

That for the proper continuance of the important work initiated at this conference of farmers and business people from the district within eighty to one hundred miles' radius of Lethbridge, there should be formed the Irrigation Development Association, with an executive as follows: chairman, vice-chairman, secretary-treasurer, and twenty-five others, with power to add to their number.

#### AIMS AND OBJECTS.

1. To further the use of irrigation water from our mountain streams for the stabilization of our farming operations and for the steadying from year to year of our business operations.

2. To aid in the organization of irrigation districts.

3. To maintain connections between our farmers and the Dominion Government and the Alberta Government to these ends, and to secure the assistance of these governments, financial and otherwise, for the furtherance of the work of the association.

*Membership.*—To be open to all interested farmers and business men on an annual membership fee of \$2, of which \$1.50 will be subscribed to the main association and fifty cents to each respective local association.

*Meetings.*—Meetings of the executive to be held not less often than once in every three months, and a general meeting at least once a year.

*Central office.*—The headquarters and central office of the association to be established at Lethbridge.

*Local associations.*—Macleod, Monarch, Barons and Carmangay, Coalhurst and Commerce, West Lethbridge, Iron Springs, Turin, Sundial, Grassy Lake, Bow Island



## SESSIONAL PAPER No. 25

and Purple Springs, Taber, Barnwell, Chin, Coaldale, Foremost, Etzikom and Nemiskam, Wrentham, Stirling, Raymond, Magrath, Cardston, Glenwood and Hill Springs, Milk River, Warner, New Dayton, Masinasin, Altorado."

It will be noted from the local associations named that the membership of this association embraces all the districts which will be affected by all the new irrigation projects now contemplated in southern Alberta, namely: The Lethbridge Southeast Project, The Lethbridge Northern Project, The Taber Irrigation District, The Macleod Irrigation Project and the United Irrigation District.

The formation of the Irrigation Development Association was the outcome of a very marked movement which had taken place amongst the farmers in southern Alberta during the winter in favour of irrigation development. Several distinct projects are contemplated, but the formation of this association was for the union of all local interests for the advancement of the common interests of the south country.

During the winter, irrigation meetings were held at fifteen different points as follows, in the order in which the meetings were held. Macleod, on December 20, 1918; Raymond, Magrath, Taber, Foremost, Etzikom, Milk River, New Dayton, Turin, Coalhurst, Monarch, Bow Island, Burdett, Lethbridge and Warner on March 15, 1919. The total attendance of these meetings was over twenty-four hundred. The most conspicuous meetings were at Raymond where the attendance was three hundred; at Taber where the attendance was four hundred and fifty; and at Lethbridge where nearly four hundred and fifty delegates registered, with probably seven hundred in attendance at some time during the all-day meeting.

The question must naturally arise, what was the reason for this very marked movement? This question can best be answered by recalling that over practically all of the country affected by the contemplated developments there was a very lean crop in 1917 and a crop failure in 1918—both due entirely to drought. In the same districts the past ten years have produced only three good crops, due to the same cause. Then the moral effect of the great war and the national call to the farmers for greater production, caused most men to take stock of their surroundings.

## LETHBRIDGE EXPERIMENTAL STATION.

COMPARATIVE results of Crops grown on Dry and Irrigated Land.  
Yield in bushels per acre.

	1908.		1909.		1910.		1911.		1912.		1913.		1914.		
	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	
Wheat - Marquis . . . . .	29	43	31	40	11	23	Hai led.		28	50	25	52	24	54	
Oats -Banner . . . . .	80	88	56	77	21	68	Hai led.		77	145	73	115	49	113	
Barley - Swedish Chevalier . . . . .	55	61	44	69	12	54	Hai led.		41	77	50	93	25	90	
Peas -All Varieties . . . . .	19	19	19	19	12	33	23	39	41	62	31	42	19	52	
Potatoes-Irish Cobbler . . . . .	92	235	159	605	103	521	356	568	296	501	195	483	400	495	
	1915.		1916.		1917.		1918.		Average.		Increase due to Irrigation.				
	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Bushels.				
Wheat-Marquis . . . . .	63	94	48	71	28	48	14	62	30	53	23				77
Oats -Banner . . . . .	143	81	118	157	56	128	24	104	70	108	38				54
Barley-Swedish Chevalier . . . . .	86	80	64	79	40	82	17	91	43	78	35				81
Peas -All Varieties . . . . .	53	50	46	37	23	48	16	48	27	41	14				51
Potatoes-Irish Cobbler . . . . .	283	447	475	530	157	465	93	505	237	487	250				105



10 GEORGE V, A. 1920

Think of these conditions, and then read the story told to the farmers by W. H. Fairfield of the Dominion Government Experimental Station at Lethbridge, and see the chart which he exhibited to them.

Quoting Mr. Fairfield very briefly, he explained the chart above as follows:—

“The experimental farm is bisected by an irrigation ditch so that a part of the farm is above the ditch and is dry farmed and a part is below the ditch and is irrigated. The figures shown in the chart have been very carefully selected showing the actual results gained during the past eleven years on crops where the only difference was between dry land and irrigated land. There was no special attempt made to get results that would show the difference between dry land and irrigated land—the aim was to develop methods for gaining the best results, both on dry and on irrigated land. The crops were grown on small plots under very special cultivation, so that all the yields are probably higher than produced on the average farm—but the difference between the yields should be the same as on an ordinary farm. The last column speaks for itself in showing the average increase over eleven years—some wet and some dry—due to irrigation. And further all the dry crops were produced on summer-fallow which requires that for every acre producing a crop in any year, another acre is lying fallow. The irrigated land produced a crop under rotation, every year. Therefore to get a true comparison between the dry and the irrigated land the figures in the last column should all be doubled. And again, the chart makes no mention of alfalfa or the hay crops which are, perhaps, the most profitable of all on the irrigated lands. There can be no comparison made, because neither alfalfa nor dry grasses can be grown commercially on dry land. The average farmer in the Coaldale district (east of Lethbridge) on irrigated land produces about three and one-half tons of alfalfa per acre each year.”

#### *Macleod Irrigation Project.*

This project was previously surveyed with reference to some nine thousand five hundred irrigable acres lying directly south of Macleod and a report was submitted in 1916-17. The active interest in irrigation during the winter included the land owners in the strip of smooth country south of Macleod between the rough breaks of the “Ridge Between the Rivers” and the Waterton and Belly rivers, and running to a point near Ewelme.

The irrigation of this new area contemplates a diversion from the Waterton river, either direct or through the works of the United Irrigation District. A very brief reconnaissance was made in the field during the winter in this connection, and it is probable that a direct diversion would be very difficult and expensive. It has also been stated that it is feasible to tap the Oldman river at Brocket, run down to a mile south of Chokio and then by taking advantage of a depression in the country, bring a canal through the Ridge Between the Rivers, and thus command all of the irrigable area lying to the south of Macleod. We have not as yet made any reconnaissance to test the feasibility of this route.

During the winter approximately one-third of the land owners who would come under the proposed canals signed petitions in favour of irrigation development.

#### *Magrath-Raymond-Stirling Irrigation District.*

The organization meeting for this district was held at Raymond on February 15, 1919. It was attended by representative men from Raymond and Magrath.

The feeling of the people in this district is this: They are keenly interested in the early development of the complete Lethbridge Southeast project and will do everything in their power to forward this project. On the other hand, they are crying for more irrigation water, and lest the complete project be not constructed in the near



## SESSIONAL PAPER No. 25

future, they have decided to organize now so that they will be prepared to carry on such construction as will allow of the irrigation of every acre in the district that is not now being served by the Alberta Railway and Irrigation Company's canal.

Reference to the map showing the second system of canals accompanying the report in 1915 on the Milk and St. Mary project will show tracts 1 B and 4 lying above the present Alberta Railway and Irrigation Company canal, with irrigable areas of 4,096 acres and 6,770 acres respectively. And further, there are shown tracts 1A and 2 containing 20,440 irrigable acres and 31,700 irrigable acres respectively, wherein only a small portion of the irrigable areas are at present supplied from the Alberta Railway and Irrigation Company canal. The idea of the formation of the irrigation district is to provide for the irrigation of the irrigable lands lying above the Alberta Railway and Irrigation Company canal, and also to supply the irrigable land lying below the canal, which is not at present supplied and for which land no water rights can be obtained by the farmers at the present time from the Alberta Railway and Irrigation Company.

The owners of practically all the land in this district have already petitioned for the development of the Lethbridge Southeast project, and the great majority are no doubt in favour of further irrigation development. Up to the time of writing this report the irrigation district has not been formally erected, and it is not known whether the special petitions required have been signed and submitted.

*The United Irrigation District.*

The lands which comprise this proposed district lie between the Belly and the Waterton rivers and originally comprised the old Cochrane ranch. They are now owned by the Alberta Stake of Zion (Mormon Church) which purchased the land and then colonized it.

In July, 1906, the Alberta Stake of Zion made application for the irrigation of this district but at that time contemplated a water supply from the Waterton river. After making surveys and estimates of the project the scheme was dropped on account of the high cost of diverting the water from the Waterton river. In March, 1919, the Alberta Stake made a new application on behalf of the United Irrigation District, contemplating a water supply from the Belly river. No final plans are available as yet, but it is known that the diversion from this source will be very cheap, as in fact will be the whole project as now contemplated.

The lands affected comprise a total area of about 67,500 acres. At the time of writing this report the necessary petition for the erection of the Irrigation District has been circulated and very largely signed but the district has not yet been formally erected.

## DUTY OF WATER AND IRRIGATED CROP REPORTS FOR 1918.

The study of the question of the proper duty of water requires the collection of a great deal of detailed information and then a very careful study of all the data available. The report submitted for separate publication contains all the most interesting data in condensed form. This summary report merely outlines the scope of the work and notes the conclusions arrived at tentatively at this time.

Work was continued at the Strathmore demonstration station, but owing to the shortage of help it was not found possible to keep a record of the water applied but only of the crops produced. Experimental plot work was carried on this year for the first time at Brooks and was continued as during the past years at Ronalane. Data regarding the duty of water were collected at Coaldale and irrigated crop reports were submitted by the inspecting engineers for the Cypress Hills district, mainly in Saskatchewan, and for the Macleod district in Alberta.



DISCUSSION OF SUMMARIZED DATA.

The natural precipitation varies greatly from year to year and directly affects the duty of water. In dry years a greater depth of irrigation is required than in wet years. The clearest way to view the matter is to consider both natural precipitation and irrigation water simply as so much depth of water applied to the crops. Then by adding together natural precipitation and irrigation water to get the total depth of water applied and thus have a figure which is readily comparable from year to year. This latter statement must not be accepted absolutely, because the seasonal distribution of the precipitation and temperature also has a marked effect on the crop growth. It must always be kept in mind that soil and subsoil conditions have a very marked effect on the duty of water, so that in comparing results gained at different places many conditions must be considered to get a true perspective.

In previous reports attention has been drawn to the difficulty of drawing definite conclusions from the data available. In work of this nature where results vary from year to year, it is necessary to have them tabulated consecutively over a considerable period before definite conclusions can be drawn. Instead of waiting until the end of the period before publishing results, it has been thought better to publish the data annually and also such conclusions as could be drawn from them. Previously it has been the practice to summarize the results gained in a short statement regarding each crop. As the period of years to which reference has to be made lengthens, this method becomes more and more difficult and is apt to be confusing. In this report the data have all been summarized in the table below, which it is thought shows correctly the average of all results gained to date. The column Crop is inserted as a useful index to the results gained at the different places. The column Depth shows the total of water received in feet (irrigation plus precipitation). The average depth shown is the average of the depths at the different places according to the number of years records. The column marked 1-4 shows the average for the four places, and the column marked 2-4 shows the average for Coaldale, Ronalane and Brooks only. The results at Strathmore are based on plot work carried on for five years, but owing to several causes the crop data cover only from one to four years records. The data at Coaldale are based on results gained by average farmers irrigating their own fields over a period of six years. The crops at Coaldale have been omitted because they would not be comparable with the crops grown on the small plots.

The results at Ronalane are based on plot work carried on consistently for four years and constitute the most reliable data available at the present time. The results at Brooks are based on plot work, but cover the year 1918 only. For Strathmore, Ronalane and Brooks the figures shown are the average, at each place, of the total depths of water producing the best crop in each year; for Coaldale the figures represent the average of ordinary crops in each year.

	1. Strathmore.		2. Coaldale.		3. Ronalane.		4. Brooks.		1-4	2-4
	Crop.	Depth.	Crop.	Depth.	Crop.	Depth.	Crop.	Depth.	Average Depth.	Average Depth.
	Bush.		Bush.		Bush.		Bush.			
Wheat ...	45	1.36	...	1.53	46	1.89	45	2.01	1.62	1.72
Oats .....	133	1.30	...	1.61	95	2.17	104	1.90	1.60	1.86
Barley .....	36	1.17	...	1.57	61	1.63	74	1.85	1.54	1.63
Peas.....	28	1.06	...	...	49	2.22	48	2.09	1.87	2.19
Potatoes ...	447	1.22	...	...	391	2.07	312	2.29	1.82	2.12
	Tons.				Tons.		Tons.			
Alfalfa....	4.26	1.40	...	2.27	3.36	2.05	...	...	2.05	2.18
Grasses .....	2.00	1.23	...	2.02	...	...	...	...	1.67	2.02
Sugar Beets	.....	.....	...	...	14.0	1.67	...	...	1.65	1.65



## SESSIONAL PAPER No. 25

In our opinion column 2-4 indicates quite closely the total depths required for the various crops in the part of Alberta south of township twenty-eight and exclusive of the strip influenced by proximity to the foothills and latitude, which might be generally described as the territory lying west of range twenty-three. The Strathmore column, while being less reliable, indicates the smaller quantities of water required in the territory lying west of range twenty-three. If this opinion is correct the figures in column 2-4 will be representative for the great bulk of all the irrigable land in Alberta.

If we assume that ultimately all irrigated farms will be one-half sown down to alfalfa and one-half cropped to one of the common grains, we are assuming a condition that represents a high water requirement and a sound system of crop rotation. The average depth from column 2-4 for wheat, oats and barley is 1.70 feet. For alfalfa the depth is 2.18 feet. Under the conditions assumed, the total depth required for the whole area would be the mean of these two figures, or 1.94 feet. Under this condition with the legal duty of 1.50 feet we must rely upon a precipitation of 0.44 foot (about 5½ inches) to meet the crop requirements.

The season of 1918 probably as dry a season as has ever been experienced in Alberta, and the average precipitation from April to September for Coaldale, Ronalane and Brooks was 0.36 foot or 4½ inches. The average long term precipitation for this season at Medicine Hat and Lethbridge is 0.86 foot or 10½ inches.







PART V

WATER POWER







# WATER POWER.

## REPORT OF THE DIRECTOR OF WATER-POWER.

J. B. CHALLIES, C.E. (Tor.), M.E.I.C.

The following report, with the attached report of J. T. Johnston, B.A.Sc., M.E.I.C., Assistant Director, concerns the activities of the Dominion Water Power Branch for the fiscal year ending March 31, 1919.

In the report for last year, special attention was called to the importance of water-power in commerce and industry in all civilized countries and the necessity of co-ordinating water-power with power from other sources in order that every section of the country should be adequately supplied with cheap and dependable power for its industrial, municipal and social requirements.

The past year has been exceedingly fruitful, several important steps have been taken towards the establishment of a uniform power policy for the whole of Canada which give every evidence of being merely the initial steps in a very definite advance. The first of these in order of importance was the establishment of the Dominion Power Board.

### *Dominion Power Board.*

In the report of last year, it was pointed out the desirability of forming a board of government officials to correlate data and evolve a master power policy applicable to all parts of the Dominion. The Dominion Power Board was constituted by Order in Council of April 25, 1918, which specified its duties and nominated its personnel; under the chairmanship of the Honourable the Minister of the Interior, the Board was subsequently added to.

### *Water Resources Conference.*

A conference was held at Ottawa on January 16 and 17 and was attended by members of the Power Board, by representatives of the Dominion and Provincial Governments, and independent authorities on water resources. During this conference a valuable exchange of views was secured on several important subjects. At the first session the Water Resources Index-Inventory system of filing and recording water resources data, as worked out and adopted by the Dominion Water Power Branch, was fully explained to the conference, and a resolution was passed recommending that all federal and provincial organizations adopt the system and that to this end a suitable explanation of the system, accompanied by maps, diagrams, etc., be published for general distribution.

The question of standardization of method, co-ordination of survey work and publication of results in hydrometric work was next discussed. The material for discussion was too extensive to allow this conference to adequately deal with the matter; a resolution was therefore passed calling for two territorial conferences, one for the East and the other for the West, with a subsequent conference at Ottawa under the auspices of the Dominion Power Board to co-ordinate the conclusions of the two territorial conferences and work out a standard practice for hydrometric work for the whole Dominion.



10 GEORGE V, A. 1920

The last two sessions of the conference were mainly devoted to the discussion of water-power regulations with special reference to the more contentious features, such as the nature of franchise, termination of license, compensation, rental, control of stock and bond issues. A very valuable exchange of views resulted and it was arranged that lists of leases, federal and provincial, with information as to the main provisions be furnished to the secretary of the Power Board for collation and distribution. It was also decided to request that the Dominion Water Power Branch continue its research into administrative measures in connection with water-power resources in foreign countries and make available the results of this research to the various Canadian administrative officers.

Amongst the gentlemen attending the conference the opinion appeared to be unanimous that a very definite step forward had been taken towards closer co-operation throughout the Dominion in the investigation, study and administration of Canada's important water resources.

The Order in Council constituting the Dominion Power Board provided that at the request of the board, concurred in by the chairman, the head of any department might attach an officer of his department to the board to be placed under its direction. Under this authority the transfer of two engineers to the board was secured.

#### WATER-POWER BILL.

It was found that the legislation governing the administration of Dominion water-powers, comprised in section 35 of the Dominion Lands Act, was in many respects inadequate and needed enlarging to give more precise definition in order to afford unquestioned authority for the regulations which were under consideration. Therefore a Bill was prepared for the repeal of the above-mentioned section and for the substitution of a complete Dominion Water Power Act which should govern the administration of all water-powers under the control and management of the Minister of the Interior.

#### WATER-POWER REGULATIONS AND LEGAL RESEARCH.

During the past few years an extensive study has been made in the branch of water-power legislation and administration in foreign and other British jurisdictions with a view to perfecting our own legislative and regulative policy.

In the year 1916, a preliminary draft of regulations was prepared as a basis of discussion. This draft was subjected to the criticisms of many persons who were thought to be particularly well qualified to pass upon the subject, and has been amended from time to time in keeping with such suggestions as appear to be justified.

At the same time, many translations were made of foreign laws and regulations relating to water-power, including those of France, Switzerland, Spain, Italy, Sweden and Norway. It was found that the situation existing in each of these countries, as well as in the United States, with respect to water-power administrative and legislative problems was closely similar, the legislation in every case being in a formative state and undergoing far-reaching changes at the present time. All this material was closely studied. The corresponding sections dealing with any particular subject as well as the views of our critics, were segregated and set out for the purpose of comparison in a comprehensive report, including a thorough review of such subjects as: Procedure on Applications, Publicity and Local Hearings, Nature of Initial Grant and Extent of Minister's Discretion, Measures for Securing Prompt Construction, Time for Executing Binding Grant, Nature of Final License or Franchise, Length of License Term, Renewal Provisions, Compensation to be Paid for Works if Taken over at the end of the term, Compensation for Private Lands taken over, Rentals payable to the Crown, Power Output Clauses, Power Sale Clauses, Stream Regulation and Control, Appraisal and Accounts, Rates to Consumers, Non-capitalization of Grants, Transfers and Penalty Clauses.



## SESSIONAL PAPER No. 25

In the summer and fall of last year, the officers of the Dominion Water Power Branch held a series of conferences taking this report as a basis and suggesting amendments to the proposed regulations. This work is now well under way and should result in producing an exemplary set of regulations.

The drafting of the water-power Bill and the extensive legal and other research necessary to the consideration of the question of water-power regulations was undertaken mainly by the legal adviser of the branch.

## DOMINION HYDROMETRIC SURVEY.

The importance of Canadian water-powers is so great, and reliable and hydrometric data for their proper exploitation so imperative that it has become obvious that co-ordination of effort in hydrometric survey for the whole Dominion is necessary.

Probably the most efficient, effective and relatively inexpensive method at achieving this result would be by authorizing the Department of the Interior to enter into co-operative agreements with the various provinces of the Dominion who already control their own resources. Certain of the provinces have already expressed a desire for such an understanding. Under a series of such agreements, it would be possible to gradually expand the hydrometric survey operations at present carried on by the Dominion Water Power Branch so as to cover the whole of Canada, and thereby achieve a co-ordination of effort, a uniformity of method and a standardization and completeness of results for publication unobtainable by the present piecemeal methods.

## LAKE OF THE WOODS CONTROL BOARD.

This Board was recently established, but decided to await the passing of the spring flood season before assuming active control. The conditions maintaining in the Lake of the Woods basin during the past year is reviewed in Mr. Johnston's report.

## BRITISH COLUMBIA WATER LANDS REGULATIONS.

In the Railway Belt in British Columbia the waters which belong to the Dominion are administered by the provincial authorities under their water Acts, and in order to enable those who have been granted water privileges in the province to have access to the Dominion lands which are required by them in the exercise of their rights, certain regulations, known as the British Columbia Water-lands Regulations, were passed by Order in Council in June, 1918, having that end in view.

These regulations and the forms which have been prepared for use in making them effective were framed after consulting all interested officials, and it is confidently expected that applications for lands required in connection with the development of water privileges will be dealt with uniformly and more promptly than was possible under the previous regulations, which were defective in this respect.

In order to secure the best results in dealing with this complicated question it is necessary to effect constructive co-operation between the officials of this Department and of the staff of the Provincial Comptroller of Water Rights, and it is gratifying to be able to state that a complete agreement has been reached.

## COSTS OF HYDROMETRIC AND WATER-POWER SURVEYS.

In March, 1914, a conference of the accountants of the branch was held at Winnipeg, with a view to co-ordinating the methods of accounting for the expenditures of money voted by Parliament and arranging a uniform cost-keeping system for use in the several offices of the branch. In so far as the accounts themselves are concerned, it may be stated that these are being uniformly rendered by each of the offices of the



10 GEORGE V, A. 1920

branch. Very considerable headway has also been made in the direction of the keeping of cost data and the reporting of these data to the head office at Ottawa. More especially is this true in so far as the operations of the branch in the province of Manitoba are concerned, while considerable progress has been made covering the operations in British Columbia.

The information contained in this cost analysis of the expenditures of the branch, enables us to determine the cost of each survey made, the capital cost of establishing each gauging and metering station and the cost of maintaining these stations. It also enables us to compare the cost of each measurement made at the various stations.

It is the desire and intention that these methods will be extended to all the activities of the branch in whatever section of the country they are being carried on.

Attached hereto is the report of Mr. J. T. Johnston, Assistant Director, who indicates in detail the activities of this branch during the past year, amongst which may be mentioned the research that is being carried on regarding the utilization of off-peak power. Another feature of the past year's work made clear in this report is the progress in co-operation with various administrative bodies charged with water resources investigation and control. This feature is of such great importance that it is really entitled to more than the only passing reference possible to give here. The extent to which co-operation is effective may be partially realized from the list of Dominion and provincial bodies with whom it is carried on, namely, the Dominion Bureau of Statistics, the Reclamation Service of this Department, the British Columbia Water Rights Branch, the Hydro-Electric Power Commission of Ontario, the Quebec Streams Commission, the New Brunswick Water Power Commission, and the Nova Scotia Water Power Commission.

### Report of the Assistant Director.

J. T. JOHNSTON, B.A.Sc. C.E., M.E.I.C.

#### HYDROMETRIC SURVEYS.

Regular stream-measurement operations have been carried on throughout the year in the provinces of British Columbia, Manitoba and Nova Scotia, while early in August last new work was instituted in the province of New Brunswick under conditions similar to those in force in the province of Nova Scotia. Owing to war conditions and depleted staffs, there was little opportunity of enlarging the scope of the regular work and attention was given to maintaining in operation the most essential established stations. Under these circumstances it is considered that a very satisfactory season's work has been accomplished.

Special efforts were made to secure records of stream flow in outlying districts where prospective development work indicated their necessity. In this connection additional winter measurements were secured in the Flin Flon mining district in North Saskatchewan through co-operation with the Reclamation Service.

In the interests of war-time economy the Hydrometric Survey reports for British Columbia and for Manitoba for the climatic year ending September 30, 1917, were temporarily withheld from publication. These reports are now being combined with the subsequent year's records and will be published in due course. The climatic year is being adopted in all our stream measurement publications in conformity with the decision reached at a conference held in Winnipeg last year between representatives of the Reclamation Service and of this branch. The province of Ontario will also adopt the climatic year for the publication of stream measurement data.



## SESSIONAL PAPER No. 25

## BRITISH COLUMBIA HYDROMETRIC SURVEY.

Activities of the British Columbia Hydrometric Survey have been continued under the direction of Mr. R. G. Swan as chief engineer in co-operation with the provincial authorities along the lines outlined in previous reports.

Owing to a depleted staff, operations were confined to the southern or more thickly settled portions of the province. The investigations in the Fort George district were again postponed but the future development of the northern districts will require the resumption of stream measurement work as soon as conditions become normal.

Numerous engineering investigations and reports have been made by Mr. Swan's staff for other Dominion Government departments which are without engineering staffs in British Columbia. The Department of Indian Affairs appointed Mr. Swan early in 1918 as technical adviser to assist in the proper establishment of water rights appurtenant to Indian reserves throughout British Columbia and in engineering matters arising from the use of these water rights. Field work in this connection was energetically carried on and information acquired regarding irrigated and irrigable areas, storage reservoirs, etc., for 18 reserves in the Lytton Agency. Supervision was given to the installation of a pumping plant for the Kamloops Industrial School and a complete survey made of that part of Kamloops Indian reserve adjacent to the North and South Thompson rivers. Attention was also given to numerous applications received by the Dominion Lands Branch for the purchase or lease of lands in the province.

The stream measurement records for the two climatic years ending September 30, 1917 and 1918, are being published as Water Resources Paper No. 23. The report is available for free distribution to all interested in problems of run-off of the rivers in British Columbia.

## MANITOBA HYDROMETRIC SURVEY.

The stream measurement work throughout the province of Manitoba has been continued throughout the year under Mr. M. C. Hendry, as chief engineer.

The operations of the Manitoba organization have been greatly hampered by the smallness of staff available due to war conditions and the work has been largely confined to stations already established. Every effort has been made to maintain the regular stations which are of primary importance to the general questions of water-power, water supply and reclamation throughout the province. In addition to this a study of run-off conditions was made in the northeastern part of the province. Several new stations were established in the southern part of the province at the request of the Provincial Department of Public Works. The information was required in connection with certain drainage problems.

The intensive study which has been carried on during the past few years at the outlets of the lake of the Woods has been continued during the year and a continuous oversight has been maintained over all the conflicting aspects of the lake of the Woods regulation. In view of the vast importance of the lake of the Woods storage to power interests on the Winnipeg river in Manitoba, it is essential that this work should receive continuous and intensive study.

The stream measurement records for the two climatic years ending September 30, 1917 and 1918 are being published as Water Resources Paper No. 24. The report is available for free distribution to all interested in problems affected by the run-off of rivers in the province of Manitoba.

## NEW BRUNSWICK HYDROMETRIC SURVEY.

In May, 1918, the province of New Brunswick entered into an agreement with the Department of the Interior looking to the co-operative investigation of the water-



10 GEORGE V, A. 1920

power resources of the province. In conformity with this agreement the province appointed the New Brunswick Water Power Commission with authority to act with the Dominion Water Power Branch.

The field investigatory work was incorporated with the similar work under way for some years in Nova Scotia under the direction of Mr. K. H. Smith, as district engineer, and the collection of fundamental hydrometric data was immediately arranged for.

Systematic and regular work was begun in August and regular stream measurement stations were established on the following streams: Dana river, Kennebecasis river, Lepreaux river, Madawaska river, Magaguadavic river, Miramichi river, Mispic river, Nashwaak river, Nipisquit river, Shogomac river, St. John river, Tobique river and Upsaliquitch river.

The work has proceeded aggressively to date and plans for its further development are now under way.

*Nova Scotia Hydrometric Survey.*—Hydrometric work has been continued with satisfactory results in the province of Nova Scotia throughout the year under the co-operative agreement between the Nova Scotia Water Power Commission and the department. The work in conjunction with the New Brunswick work is under the direction of Mr. K. H. Smith, of this department as district engineer.

Stream flow records were obtained during the year at some twenty-five regular stations and co-operation with the Canadian Meteorological Service was continued in the maintenance of precipitation and evaporation stations. The reduction of staff owing to enlistments for overseas service necessitated some curtailment of the work.

#### POWER AND STORAGE SURVEYS.

Power investigatory work in the field was very largely curtailed during the year, with the exception of special surveys or inspections required for pressing problems. Exhaustive office studies have been made into various power questions and into the water-power interests of the Dominion as a whole.

*British Columbia.*—Owing to depleted staff no field investigatory power and storage work was undertaken in British Columbia during the past year. Power work was practically confined to fundamental stream measurement operations.

*Alberta and Saskatchewan.*—No field investigation work was attempted in the provinces of Alberta and Saskatchewan during the past year. The entire available power data in the two provinces was, however, re-analysed and co-ordinated to conform with the principles of the water resources inventory scheme, and the results compiled into comprehensive reports covering the two provinces. A great amount of additional field reconnaissance work is still necessary before the water-power resources of the two provinces are fully and satisfactorily analysed.

*Manitoba.*—While power investigatory work in Manitoba was considerably curtailed during the year owing to lack of staff, a special effort was made to have the office records analysed and co-ordinated with the water resources inventory scheme. This was satisfactorily completed.

An inspection of Meadow Portage was made by the chief engineer, in connection with the study of the power possibilities at that point. Additional information was gathered by one of the staff to supplement that already on hand and a report prepared covering the situation.

The reconnaissance survey of the Barens river made in 1914 up as far as Family lake was further extended in July and August, 1918, to take in Fishing lake. A survey of this lake was made to determine to what level it might be raised to benefit the head at the proposed power site of Little Grand rapids.



## SESSIONAL PAPER No. 25

Supervision was continued over the alterations to the plant of the Winnipeg Electric Railway Company on the Pinawa channel of the Winnipeg river. The work was considerably hampered by lack of suitable labour and remained unfinished at the close of the season. Additions to the plant of the city of Winnipeg at Point du Bois were completed and a new unit put in operation under supervision of the department. Mr. W. J. Ireland, assistant chief engineer to Mr. Hendry, has acted as inspecting engineer in the above two instances in addition to his other duties.

Power applications on the Hole river renders an examination of the stream necessary during the forthcoming season. If at all possible, power survey work should be inaugurated on the Nelson river. The line of check levels from Lac du Bonnet to Kenora should also be run at the earliest feasible date. Whether this work can be undertaken during the present season will depend on the staff available.

*New Brunswick.*—In accordance with the terms of the co-operative agreement between the Department and the province of New Brunswick referred to in the foregoing, reconnaissance power investigations have been made of the Mispic, Shogomoc, Charlo and Nipisquit rivers as well as portions of the Lepreaux, Magogadavic, Tobique and Madawaska rivers. On the Pokiok river sufficient surveys and storage investigations have been completed to enable a power report to be made as soon as sufficient run-off records are available. Storage surveys and investigations have been completed on the Tetagouche river but a profile survey of the lower portion of the river as well as run-off records covering a more extended period are necessary before any reliable power estimates can be made.

Systematic power investigatory work will proceed under the direction of Mr. K. H. Smith as rapidly as funds and staff will permit.

*Nova Scotia.*—Owing to a depleted staff due to war conditions no extensive power surveys were undertaken in the province of Nova Scotia during the past year. Only these investigations were undertaken for which specific requests were made. Full co-operation was maintained at all times with the Nova Scotia Water Power Commission.

Surveys were carried out under Mr. Smith's direction on South river, Antigonish at Fraser Mills; on the upper waters of the Musquodoboit river in the vicinity of Mill lakes; at Grand river falls in Richmond county, Cape Breton and in connection with a proposed power development of considerable magnitude involving the diversion of lake Ainslie, Inverness county, C.B. A general description of each of these power sites with the results of the investigations made was prepared and is given in the 1918 report of the commission, copies of which may be secured upon application to the secretary.

## CO-OPERATION WITH THE PROVINCE OF ONTARIO AND PRINCE EDWARD ISLAND.

In January of the present year the Hydro-Electric Power Commission of the province of Ontario intimated that the commission would be agreeable to a co-operative investigation of the water-power resources of the province. The basic principles of this agreement involved the Dominion assuming responsibility for all hydrometric survey and fundamental investigatory work while the commission assumed responsibility for all special power studies. Negotiations along these lines have been under way for some time and it is expected that within a short period a mutually satisfactory agreement will be drawn up and executed.

In February last an intimation was received from the Premier of Prince Edward Island that that province would welcome a water resources investigation under the auspices of the Dominion Water Power Branch similar to the investigations under way in the provinces of New Brunswick and Nova Scotia. Arrangements were accordingly made for the inclusion of Prince Edward Island with the investigatory work under way in the Maritime provinces.



10 GEORGE V, A. 1920

## CO-ORDINATION OF MARITIME PROVINCES INVESTIGATORY WORK.

In February a joint communication was received from the Premiers of Nova Scotia and New Brunswick urging that the Federal Government assume full responsibility for the fundamental power investigatory work under way in the respective provinces. Interests of economy and efficiency called for the co-ordination of the work in Nova Scotia, New Brunswick and Prince Edward Island, and made it desirable to revise the previously existing agreements with the Nova Scotia and New Brunswick authorities and to include also Prince Edward Island. Accordingly a co-operative agreement between the Dominion Government on one hand and the provinces of Nova Scotia, New Brunswick and Prince Edward Island on the other is at the present time being worked out. The basic principles of this agreement involve the Federal Government assuming responsibility for all hydrometric survey and fundamental water-power investigatory work, while the provincial governments assume the responsibility for all special power studies. It is anticipated that this agreement will be executed in the near future.

## DOMINION LAND SURVEYS AND RECLAMATION.

Dominion land survey and reclamation work as it affects the administration of water-powers was carried on throughout the year under the direction of Mr. T. H. Dunn, D.L.S.

At the request of the Department of Indian Affairs an inspection of Pemberton Meadows at the head of Lillooet lake was made in company with Mr. R. G. Swan, Chief Engineer of the British Columbia Hydrometric Survey. Indian lands in this district are subject to flooding due to the insufficient size of the outlet of Lillooet lake to pass the freshet flow. Estimates of cost and recommendations of the best methods of reclaiming these flooded lands were made.

An inspection of Meadow portage connecting lakes Winnipegosis and Manitoba in the province of Manitoba was made in company with Mr. M. C. Hendry, Chief Engineer of the Manitoba Hydrometric Survey. Estimates of cost and the feasibility of excavating a canal connecting these two lakes for reclamation and water-power purposes were made.

The question of flooded lands along the Winnipeg river in connection with the developed and undeveloped power sites was thoroughly revised preparatory to undertaking the field work necessary to properly safeguard the interests of power and of the settlers. Mr. Dunn will cover the most contentious reaches during the forthcoming season.

## LAKE OF THE WOODS REGULATION.

The control of the regulation of the Lake of the Woods has been continued as outlined in previous annual reports pending the adoption by the Canadian and United States Governments of the recommendations made by the International Joint Commission in respect to the Lake of the Woods Reference. The arrangement made in September 1916, between this office and the Department of Public Works of the Province of Ontario, whereby this Branch would advise the Ontario authorities as to the operation of the Norman dam, have worked out satisfactorily. Systematic records are received daily and weekly from various points throughout the watershed covering meteorological and run-off conditions. Based upon a study of this data and of general conditions maintaining throughout all portions of the basin, recommendations are made to the Ontario authorities as to the operation of the dam.

A review of the conditions which have been maintained on the lake since advice as to the control was made the responsibility of the Dominion Water Power Branch,



## SESSIONAL PAPER No. 25

compared with the conditions which maintained on the lake in preceding years will indicate the benefits accruing from a regulation which gives full consideration to not only all interests directly affected but also to all meteorological and storage conditions developing or maintaining throughout the watershed. Prior to this supervised control the lake level had varied in elevation through a range of eight or more feet. Low level upon the lake had at times most seriously interfered with navigation and the operation of power plants upon the lake outlets. Abnormal flood elevations had on the other hand caused great damage to foreshore interests, in both Canada and the United States. Since the present arrangement has been in operation, *i.e.*, from September, 1916 to date, a most equitable regulation has been maintained. During the year 1917 the extreme variation of the lake level, ignoring wind effects, was 1.2 feet. During the year 1918, the extreme variation of level, ignoring wind effects was 0.9 feet. During both navigable seasons, ideal navigation conditions were maintained on the lake, while an ample reserve of stored water was at all times available for power or navigation uses in anticipation of a prolonged dry period. In brief, the regulation on the lake has been very carefully maintained in the best interests of all affected.

During the present season steps have already been taken at the dam in anticipation of the spring inflow and all necessary preparations have been made to satisfactorily handle any flood inflow which is to be anticipated.

In accordance with the recommendations of the International Joint Commission, a Lake of the Woods Control Board, consisting of four qualified civil engineers, two to represent the Dominion of Canada and two to represent the province of Ontario, was appointed by Order in Council dated January 21, 1919. This Board will henceforth assume the responsibility of regulating the Norman dam and controlling the surface levels of and the outflow from the Lake of the Woods.

## RESEARCH INTO UTILIZATION OF OFF-PEAK POWER.

For some years past this department has been interested in the increased industrial use of the off-peak power available in practically all central stations throughout the Dominion. Any means whereby this idle power may be put to advantageous use will be a boon to the central station industry but more so to the country as a whole. Particularly is this the case in Canada where ninety per cent of the central station industry is based upon water power. Actual research in this connection has been under way for the past few years in co-operation with one of the larger power companies. The results have been so satisfactory to date that arrangements are now under way to have the work carried on under the sole direction of the Department.

## WATER RESOURCES INVENTORY.

The general water resources index inventory referred to in previous annual reports has been broadly developed during the past year. The system offers a method of filing, recording and analysing water resources data which meets the requirements of practically any organization interested in water resources administration or investigation.

The multiplicity of organizations, Dominion and Provincial, engaged in securing water resources data for various governmental purposes, often without co-ordination in either field or office systems, has resulted in a great variety of methods both for filing such data and for making it available for general use. Consequently, it has long been apparent that some universally adoptable scheme for indexing and filing water resources data will be exceedingly valuable, a condition that will be all the more evident when one considers not only the increasing amount of water resources investigation being carried on but also the complexity and interrelation of the data so obtained. In view of the above, a filing system which has been named a "Water Resources Index Inventory," has been developed by the Dominion Water Power Branch, and at a



10 GEORGE V, A. 1920

Water Resources Conference recently held under the auspices of the Dominion Power Board, a body charged with the responsibility of co-relating and systematizing available information respecting the water-power and fuel-power resources of Canada, was adopted by that Board, and recommended for publication.

This system has accordingly been proffered by the Board to any and all interested as a method of filing and recording water resources data that it is hoped will meet the requirements of, and be found of help to, any organization interested in that subject. Moreover, through its provision of a uniform indexing basis, it will much facilitate the interchange of water resources information among all those interested therein, and the co-relating of the efforts of all those engaged in water resources research, development, and control, with a corresponding increase in the value of their individual results and the usefulness of the data which they may compile.

The characteristics of the data which are essential to the proper consideration and analysis of water resources are so varied that a purely alphabetical index becomes cumbersome and unworkable. The same may be said of a topic index developed solely on the topic basis.

*A filing system for water resources information should combine graphical with analytical features, and should become an index to, as well as an inventory of, water resources data.* To secure a comprehensive grasp of a water-power situation, such information as the location of water-power sites, water-power developments, storage reservoirs, stream measurement stations, meteorological stations, etc., must be graphically recorded so that the entire situation is visualized. In conjunction with this graphical representation, an alphabetic or topic index is essential.

In brief, the system involves the division of the Dominion into suitably sized areas based on the drainage basins, and the filing of the water resources data for these various areas under suitable topic headings. The filing system assumes that the operator is acquainted with the location of the district or territory in which he is interested. The general key map shows the index number of the subdivision in question, and the available data in that region is automatically brought to hand by referring to the topic reference cards of the subdivision. A cross index of river, lake or place names with the index divisions is a convenience which may be developed as the necessity arises in the application of the system.

The fact that water resources information in general is based upon, and may be advantageously tied in to, watershed areas, suggested the adoption of a graphical index based upon drainage areas rather than upon arbitrary divisions by longitude and latitude. The system of division and subdivision which has been adopted has been developed with the idea of securing index maps of a scale suitable to record any desired data.

Following the division and subdivision of the Dominion into suitably sized areas, these areas were reproduced in a series of index maps suitable for the plotting of graphic records. Photographic reproductions, 12 inches by 9½ inches within the border, were prepared covering the entire series of subdivisions. These reproductions were made from the latest published federal and provincial maps. The principle adopted was to first photograph the complete watersheds of the major rivers and afterwards the index divisions, the latter to such a scale as to reproduce in readily readable form the information on the original map. These index maps have been printed on 11 inch and 14-inch sheets and bound in loose-leaf covers, the whole series forming a complete reproduction of the latest published maps of the Dominion.

The system of index maps is flexible and permits of any further degree of expansion which may be necessary. Any portion of any subdivision may, if desired, be enlarged to record graphically the details of any particular situation or project. The index maps at all times record the locations and index numbers of all the water resources items which can be graphically recorded.



## SESSIONAL PAPER No. 25

Complementary to the graphical index, a system of cards and folders has been developed for the purpose of referencing the vast amount of data which is now available in published and in special reports, and in the form of records of all descriptions covering existing power plants, possible power sites, reservoirs, water supply, drainage and reclamation, etc., etc. The general principle adopted is to file under topic headings the data in each subdivision. Where the information to be filed is of a general character, it is also referenced under the larger divisions.

These cards are purely reference cards and each records for its particular division or subdivision, the references to the data which are available in that division and under that heading. The group of cards form an inventory of the entire pertinent data available in the division.

With each subdivision and its series of cards there is provided a folder similarly labelled for the filing of all loose computations, newspaper clippings, run-off measurements and other pertinent data. This folder may be subdivided with subfolders for the topic headings if desirable.

Some of the outstanding advantages of this filing system may be listed.—

1. The system is essentially simple in conception and in operation.
2. Once in operation with existing data filed, it is almost automatic in bringing required information to hand.
3. Any person interested in a particular district or river can secure for himself without trouble the information which is available.
4. It visualizes the water resources data on the index maps.
5. Being founded on drainage areas, it compiles the data in the form best adapted for the consideration of hydraulic problems.
6. When brought up to date it will render immediately available much pertinent data now buried in old files and office records.
7. It is flexible and capable of enlargement or contraction to the requirements of any organization using it.
8. It permits the continuous addition of new filing references.
9. When adopted by federal and provincial administrative or investigatory departments and by other organizations interested in the study of water resources, it will render the known pertinent data available for mutual interchange and convenient use.
10. Its adoption by federal and provincial organizations will result in uniformity in methods of filing, collating and analysing water resources data throughout the Dominion.

The more important Federal and Provincial Departments and organizations who have accepted the index inventory might be mentioned. The system is in practical application in all the field investigatory work of the Dominion Water Power Branch. Other branches of the Department accepting the system are the Reclamation Service and the Natural Resources Intelligence Branch.

Dominion organizations accepting the system include the Honourary Advisory Council for Scientific and Industrial Research and the Dominion Power Board, the latter of which has recommended it for publication and for adoption by all interested in administering or investigating water resources data.

Provincial organizations adopting the system include the Hydro-Electric Power Commission of Ontario, Quebec Streams Commission, New Brunswick Water Power Commission, Nova Scotia Water Power Commission and the British Columbia Water Rights Branch.

The Imperial Board of Trade has also recommended the adoption of the index inventory system in practically all its phases for use throughout the United Kingdom.



10 GEORGE V, A. 1920

## CENSUS OF CENTRAL ELECTRIC STATIONS.

During the year a census of the central electric power stations of Canada was carried to completion by the Dominion Water Power Branch in co-operation with the Dominion Bureau of Statistics working in co-operation with the Ontario Hydro-Electric Power Commission, the Quebec Streams Commission and the provincial departments concerned. The complete report is being published in two parts, Part I, comprising a complete census and statistical survey, with accompanying explanatory matter, whilst Part II forms a comprehensive directory of all commercial and publicly-owned central power stations in operation throughout Canada, showing the principal features of each, the locations where blocks of electrical energy are for sale, the prices at which power is obtainable, transportation facilities available in the vicinity, etc. The collection of the data was made by the Bureau of Statistics and the Provincial Departments and the analysis and preparation of the data by the Water Power Branch.

The statistics complete to January 1, 1918, include only central electrical stations, that is, stations developing electrical power for sale; all other electrical establishments such as electric railways, etc., are excluded. Outstanding features of the report are as follows.

The capital invested in central power stations totals \$356,004,169. The total revenue received from the sale of electrical energy is \$44,536,848. Of special interest is the actual cost of construction of hydro-electric power stations per installed horse power. Omitting all real estate, transmission and distribution equipment, seventy representative hydro-electric stations throughout the Dominion, with an aggregate turbine installation of 745,797 horse-power and a total construction cost of \$50,740,458 show an average cost of \$69.11 per installed turbine horse-power. The figure in brief represents the average capital cost of construction at the power site and is of considerable interest to engineers.

One of the most important facts disclosed as a result of the statistics is the outstanding positions which water-power takes in the central station field. Out of a total installed primary capacity of 1,844,571 horse-power, 1,652,661 or 89.6 per cent—practically 90 per cent—is derived from water. This figure is indicative of the extent and availability of the water-power resources of the Dominion and of the remarkable degree to which their adaptability for central electric station work has been appreciated in principle and realized in practice. The vast water-power resources of the Dominion, the ready adaptability of hydro-power to the production of electrical energy and the increasing extent and scope of economical electrical transmission form an industrial asset which probably more than any other will ensure a full measure of future prosperity.

Part II of the report, comprising a Directory of Central Electric Stations, is exhaustive and comprehensive in scope and will prove a valuable asset in the reconstruction period as it permits a bird's eye view of the present status of the industry in all parts of the Dominion and indicates the locations where expansion is readily feasible.

For Part I (statistical) application will be made to the Dominion Bureau of Statistics, while the Directory Part II will be distributed by the Dominion Water Power Branch as Water Resources Paper No. 27.

## CENSUS OF DEVELOPED WATER POWER.

In conjunction with the census of central electric stations, a census of the developed water-power of the Dominion has just been completed by the Dominion Water Power Branch in co-operation with the Dominion Bureau of Statistics. The water-power resources of Canada, with their strategic locations adjacent to practically



## SESSIONAL PAPER No. 25

every industrial centre, constitute one of our greatest assets, and it is satisfactory to note that the economic advantages accruing from utilization of these powers for industrial purposes is being fully realized in practice.

The returns (complete to January 1, 1919) indicate a total developed water-power capacity of 2,305,310 horse-power. This figure is several hundred thousand in excess of any estimate previously published and indicates that Canada's utilization of hydro power is even more marked than had been appreciated.

Of the total water-power developed 1,727,471 horse-power is installed in central electrical stations, that is to say, in stations developing electrical energy for distribution and sale; 352,214 horse-power is installed in plants owned and operated by pulp and paper companies, and 225,625 horse-power is installed in other miscellaneous manufacturing and general industrial establishments. The foregoing figure for pulp and paper companies does not, however, represent the total amount of water-power used in that industry; upwards of 100,000 hydro-electric horse-power in addition, is purchased by pulp and paper companies from central electrical stations making the total hydro power utilized in pulp and paper industry some 450,000 horse-power.

Returning to the central electrical station total of 1,727,471 horse-power, it is of interest to record that the central stations already constructed throughout the Dominion are designed for a machine installation of 530,000 horse-power in addition to the machinery now installed. Of this amount, the installation of some 270,000 horse-power is at the present time under contemplation in various parts of the Dominion. These figures do not include the 300,000 horse-power Queenstown Plant which the Hydro-Electric Power Commission of Ontario has under construction at Niagara.

In the Yukon the hydro power developed per thousand population totals 1,574 horse-power, in British Columbia 506 horse-power, in Quebec 376 horse-power, in Ontario 359 horse-power, and in Manitoba 153 horse-power. The other provinces average smaller figures. The ratio for the entire Dominion averages 276 horse-power developed per thousand population. The availability of hydro power, the distribution, density and occupation of the population have a very direct bearing upon the amount of power developed. The exceptionally high ratio in the Yukon is accounted for by extensive use of hydro power in the mining industry in conjunction with the comparatively small population.

The per capita figures of hydro power developed for the Dominion, when compared with similar figures for other countries, are indicative of the advanced position which this country takes both in the extent and in the utilization of its water-power resources. Norway and possibly Sweden are the only countries where the per capita utilization of water-power exceeds that of Canada. The most recent figures available for the United States would indicate a utilization of considerably less than 100 hydraulic horse-power per thousand population, as compared with 276 per thousand in Canada. The fundamental reason underlying the extensive use of water-power in Canada is the fact that practically every commercial centre from coast to coast, excepting only a few in the middle Prairie Provinces, has abundance of water-power available, not only for present needs but for all anticipated requirements.

## CO-ORDINATION OF EMPIRE WATER RESOURCES.

Throughout the past season the department has taken advantage of the presence of Mr. H. E. M. Kensit, electro-mechanical engineer of the Dominion Water Power Branch, at present in London, to get in close touch with the activities of the Imperial Government in respect to the analysis of the water resources of the Empire with a view to co-ordinating investigatory work and administrative principles in so far as possible.



10 GEORGE V, A. 1920

Throughout the year Mr. Kensit has been in close and continuous touch with the Conjoint Board of Scientific Societies formed in June, 1916, under the chairmanship of Sir Dugald Clerk, at the instance of the Council of the Royal Society after a conference with representatives of the leading societies of the United Kingdom, and now comprising a membership of fifty-four of such societies. The board was constituted for the furtherance of the following objects:—

“Promoting the co-operation of those interested in pure or applied science; supplying a means by which the scientific opinion of the country may, on matters relating to science, industry and education, find effective expression; taking such action as may be necessary to promote the application of science to our industries and to the service of the nation; and discussing scientific questions in which international co-operation seems advisable.”

The board appointed ten sub-committees to deal with various scientific and industrial investigations, one of these being a “Sub-committee on the Water-power of the British Empire,” with instructions to “report what is at present being done to ascertain the amount and distribution of water-power in the British Empire.”

In March, 1918, Mr. Kensit was co-opted as a member of this water-power committee in all its work and has advised the committee fully as to water-power matters throughout the Dominion both in respect to power available and developed and as to the administrative policies and investigatory procedures of the Dominion and provincial departments or commissions interested in water resources matters. The committee published a preliminary report in July, 1918, and a second in March, 1919, analysing the water-power resources of, and referring to the administrative and investigatory policies throughout the Empire. In these reports the status of water-power development in Canada compared with the rest of the Empire is the subject of many laudatory comments.

Mr. Kensit has regularly attended the hearings of the Water Power Resources Committee formed in June, 1918, by the Imperial Board of Trade, with instructions to “examine and report on the water-power resources of the United Kingdom and the extent to which they can be made available for industrial purposes.” Mr. Kensit supplied this committee with full information as to the investigatory methods adopted in Canada and supplied a complete set of the publications of the Dominion Water Power Branch, with full particulars as to the water resources index inventory system, the Dominion Power Board, etc. Mr. Kensit, by request, became a member of the “Data Sub-Committee” of the foregoing committee. After a thorough examination of the water resources index inventory system developed by this branch, the Water Power Resources Committee of the Board of Trade has practically adopted the system along with the other methods of the Dominion Water Power Branch for use throughout the United Kingdom.

Mr. Kensit's work in London has brought the water-power resources of Canada to the attention of the Imperial authorities in a manner which would not have been otherwise possible. The direct connection which has been established for the various Dominion and provincial water-power organizations will undoubtedly prove of outstanding value to the Dominion in the future development of our water resources.